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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF ENTOMOLOGY—BULLETIN No. 53.

L. O. HOWARD, Entomologist.

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# CATALOGUE

OF THE

# EXHIBIT OF ECONOMIC ENTOMOLOGY

AT THE

LEWIS AND CLARK CENTENNIAL EXPOSITION,  
PORTLAND, OREGON, 1905.

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COMPILED UNDER THE DIRECTION OF THE ENTOMOLOGIST

BY

ROLLA P. CURRIE.



WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1905.

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## LETTER OF TRANSMITTAL

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UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF ENTOMOLOGY,  
*Washington, D. C., April 11, 1905.*

SIR: I have the honor to transmit herewith the copy for a catalogue of the exhibit of economic entomology made by the Bureau of Entomology at the Lewis and Clark Centennial Exposition held at Portland, Oreg., during the present year. It has been compiled, under my direction, by Mr. Rolla P. Currie, assistant in the Bureau of Entomology, and I recommend its publication as Bulletin No. 53 of this Bureau.

Respectfully,

L. O. HOWARD,  
*Entomologist.*

Hon. JAMES WILSON,  
*Secretary of Agriculture.*

## INTRODUCTION.

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The following catalogue of the exhibit of economic entomology made by the Bureau of Entomology, U. S. Department of Agriculture, at the Lewis and Clark Centennial Exposition, will, it is believed, increase the usefulness of the exhibit by furnishing the visitor, in a convenient form for future reference, much of the data contained on the labels, and by supplying him with references to published articles from which additional information can be gained.

The catalogue has been compiled from Bulletins Nos. 47<sup>a</sup> and 48<sup>b</sup> of this Bureau and includes all portions of each of these bulletins, revised and corrected, which relate to the exhibits installed at Portland.

Owing to the fact that less space was available for the exhibit by the Bureau of Entomology at Portland than at St. Louis, it has been necessary to reduce the size of the exhibits considerably, and this has in most part been accomplished by leaving out insects which affect strictly eastern or southern crops. In other respects, however, the exhibit is very similar to that made at St. Louis, and includes all those features which proved of especial interest there. Care has been taken to retain such insects as are of especial importance on the Pacific coast and those which affect important Pacific coast industries, such as fruit raising and lumbering.

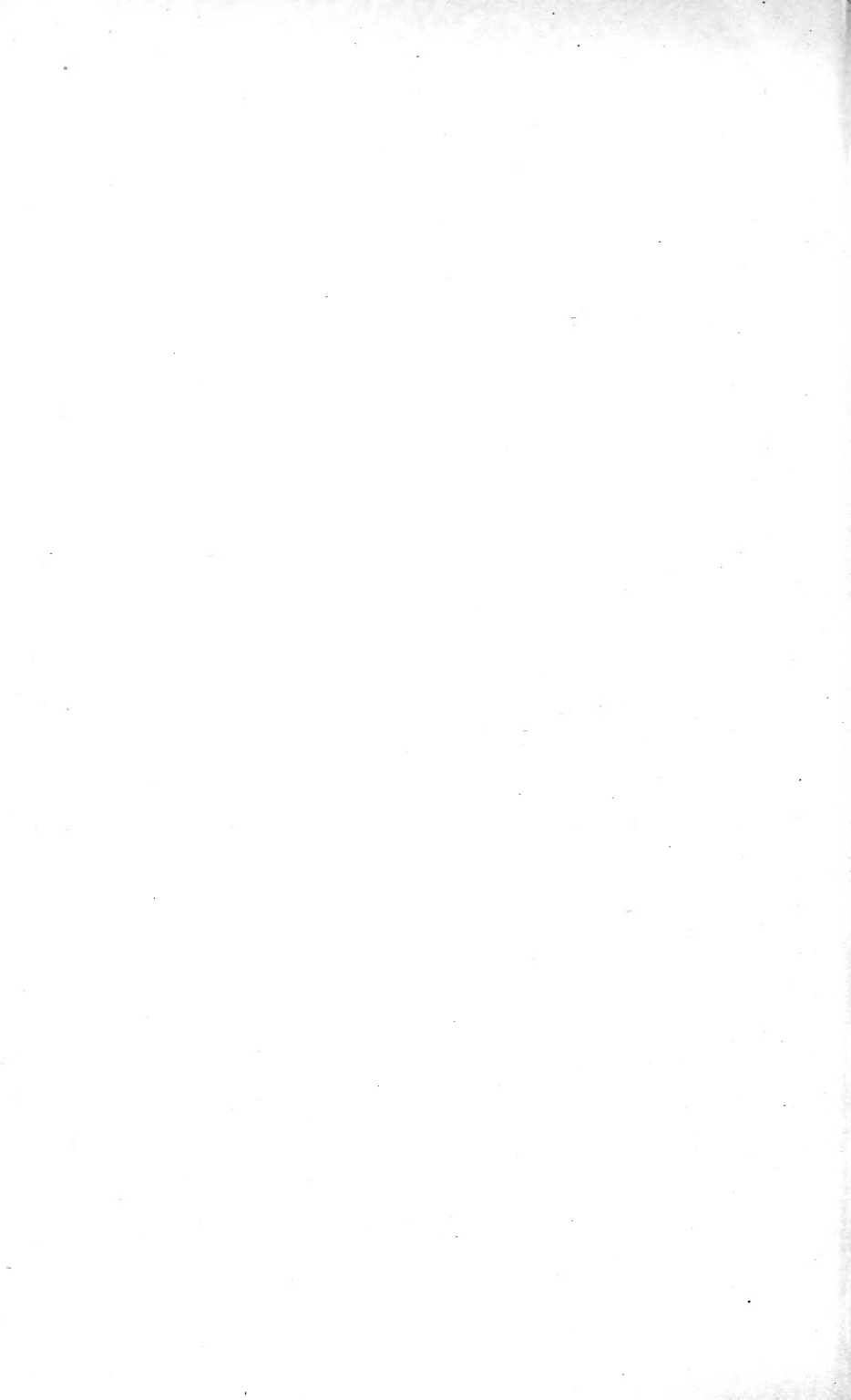
Persons desiring further information than can be gained from this catalogue, or from conversation with the attendant in charge of the exhibit, are requested to address the writer at the U. S. Department of Agriculture, Washington, D. C.

L. O. HOWARD,  
*Entomologist.*

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<sup>a</sup>Catalogue of the Exhibit of Economic Entomology at the Louisiana Purchase Exposition, St. Louis, Mo., 1904; by E. S. G. Titus and F. C. Pratt.

<sup>b</sup>Catalogue of Exhibits of Insect Enemies of Forests and Forest Products at the Louisiana Purchase Exposition, St. Louis, Mo., 1904; by A. D. Hopkins.



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# CATALOGUE OF THE EXHIBIT OF ECONOMIC ENTOMOLOGY AT THE LEWIS AND CLARK CENTENNIAL EXPOSITION.

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## INSECTS INJURIOUS TO ORANGE AND LEMON.

For general articles relating to insects affecting these fruits see Hubbard, 1885, and Insects Affecting the Orange, U. S. Dept. Agric.; Marlatt, Scale Insects and Mites of Citrus Fruits, Farmers' Bul. 172, 1903.

### THE APPLE TWIG-BEETLE.

*Stephanoderes hispidulus* Lec.

(Formerly *Hypothenemus eruditus* auct.)

EXHIBIT: Adult and work.

### THE OAK AMBROSIA BEETLE.

*Xyleborus affinis* Eichh.

For general account see Hubbard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 19-20, 1897, under *X. pubescens* Zimm.

EXHIBIT: Adult, work, and figure.

### THE PAN-AMERICAN PLATYPUS.

*Platypus compositus* Say.

For general article see Hubbard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 14-16, 1897.

EXHIBIT: Adult, work, and figure.

### FULLER'S ROSE BEETLE.

*Aramigus fulleri* Horn.

For general account of life history see Chittenden, Bul. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 88-96, 1901.

EXHIBIT: Adult.

### THE COFFEE-BEAN WEEVIL.

*Aræcerus fasciculatus* DeG.

For partial life history and general account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 36-38, 1897.

EXHIBIT: Adult and work.

### THE ORANGE CHRYSOBOTHRIS.

*Chrysobothris chrysela* Ill.

EXHIBIT: Adult.

### EPITRAGUS TOMENTOSUS Lec.

EXHIBIT: Adult.

### PACHNÆUS DISTANS Horn.

EXHIBIT: Adult.

**ORANGE LEAF-NOTCHER.***Artipus floridanus* Horn.

EXHIBIT: Adult and work.

**THE ORANGE SAWYER.***Elaphidion inerme* Newm.

For general account see Chittenden, Bul. 18, n. s., Div. Ent., U. S. Dept. Agric., p. 41, 1898.

EXHIBIT: Adult and work.

**LEPTOSTYLUS BIUSTUS** Lec.

EXHIBIT: Adult and work.

**THE ORANGE DOG; HOG CATERPILLAR.***Papilio thoas* Linn.(Formerly *P. cresphontes*.)

For brief account of larva see Lintner, 9th Rpt. State Ent. N. Y., pp. 336-337, 1893.

EXHIBIT: Eggs, larva, chrysalis, adult, and figure.

**ORANGE LEAF-ROLLER.***Platynota rosirana* Walk.

EXHIBIT: Eggs, pupa, and adult.

**THE SADDLE-BACK CATERPILLAR.***Sibine stimulea* Clem.(Formerly *Empretia*.)

For general account see Lugger, 4th Rpt. State Ent. Minn., pp. 98-99, 1899.

EXHIBIT: Pupa, adult, and figure.

**THE COMMON BAGWORM.***Thyridopteryx ephemeraformis* Steph.

For general account see Packard, 5th Rpt. U. S. Ent. Com., pp. 258-262, 1890.

EXHIBIT: Larva, cocoon, adult, and figure.

**THE STINGING CATERPILLAR.***Megalopyge opercularis* S. & A.

For short account see Lugger, 4th Rpt. State Ent. Minn., pp. 95-96, 1899.

EXHIBIT: Cocoon and adult.

**THE SKIFF CATERPILLAR.***Prolimacodes scapha* Harr.

(Larva feeds on leaves.)

EXHIBIT: Adult.

**THE ORANGE CASE-BEARER.***Eurycyttarus confederata* Grt.

(Larvæ feed upon lichens on tree trunk, occasionally gnawing fruit; formerly *Psyche*.)

EXHIBIT: Cases on twig.

**THE TWO-SPOTTED RED SPIDER.***Tetranychus mytilaspidis* Riley.

For description and distribution see Banks, Tech. series 8, Div. Ent., U. S. Dept. Agric., pp. 71-72, 1900.

For general account of *T. bimaculatus* Bnks. see Chittenden, Bul. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 35-42, 1901.

EXHIBIT: Figure.



**THE ORANGE WHITE SPOT.***Tetranychoides californica* Bks.

For description see Banks, Journ. N. Y. Ent. Soc., Vol. XII, p. 54, pl. II, fig. 1, 1904.

EXHIBIT: Work and figure.

**THE ORANGE FRUIT MITE.***Tenuipalpus californicus* Bks.

For description see Banks, Journ. N. Y. Ent. Soc., Vol. XII, p. 55, pl. II, fig. 2, 1904.

EXHIBIT: Work and figure.

**RUST MITE OF THE ORANGE; THE SILVER MITE OF THE LEMON.***Eriophyes oleivorus* Ashm.(Formerly *Phytoptus*.)

EXHIBIT: Figure.

**THE TWO-STRIPED WALKING-STICK.***Anisomorpha buprestoides* Stål.

EXHIBIT: Nymph and adult.

**THE ANGULAR-WINGED KATYDID.***Microcentrum retinerve* Burm.

EXHIBIT: Eggs, adult, and parasitized eggs.

**NORTHERN MOLE CRICKET.***Gryllotalpa borealis* Burm.

EXHIBIT: Nymph and adult.

**THE LUBBER GRASSHOPPER.***Dictyophorus reticulatus* Thunb.

For brief account see Morgan, Bul. 30, n. s., Div. Ent., U. S. Dept. Agric., pp. 28-29, 1901.

EXHIBIT: Nymph and adult.

**THE COTTON STAINER.***Dysdercus suturellus* H.-Schf.

For short accounts see Howard, Farmers' Bul. 47, U. S. Dept. Agric., pp. 30-31, 1897; Insect Book, p. 308, fig. 201 and pl. 31, fig. 15, 1901.

EXHIBIT: Nymph, adult, and figure.

**EUTHOCTHA GALEATOR** Fab.

EXHIBIT: Adult.

**THE SOUTHERN LEAF-FOOTED PLANT-BUG.***Leptoglossus phyllopus* Linn.

For general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 46-48, 1899.

EXHIBIT: Adult.

**EUSCHISTUS SERVUS** Say.

EXHIBIT: Adult.

**NEZARA HILARIS** Say.

EXHIBIT: Adult.

**WHITE FLY; MEALY WING.***Aleyrodes citri* R. & H.

For general account see Marlatt, Farmers' Bul. 172, U. S. Dept. Agric., pp. 36-38, 1903.

EXHIBIT: Adult, work and figure.

**ORANGE APHIS; COTTON APHIS.***Aphis gossypii* Glover.

(Curles leaves and stops young growth; usually well controlled by parasites and other enemies.)

For short account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 58-61, 1903.

EXHIBIT: Eggs, adult, work, figure, and the enemies *Baccha clavata* Fab., *Hemerobius* sp., *Chrysopa plorabunda* Fitch, and a hymenopterous parasite.

**COTTONY CUSHION SCALE; FLUTED SCALE.***Icerya purchasi* Mask.

(Food plants: Acacia, cypress, grasses, lemon, orange, pine, rose.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 25-27, 1903.

EXHIBIT: Infested twig.

**THE DESTRUCTIVE MEALY-BUG.***Pseudococcus citri* Risso.

(Formerly *Dactylopius destructor*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 99-100, 1903.

EXHIBIT: Infested leaves.

**THE LONG-SPINED MEALY-BUG.***Pseudococcus longispinus* Targ.

(Formerly *Dactylopius* spp.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 104-105, 1903.

EXHIBIT: Infested leaves.

**THE FLORIDA WAX-SCALE.***Ceroplastes floridensis* Comst.

(Food plants: Citrus, fig, myrtle, oleander.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., p. 157, 1903.

EXHIBIT: Infested leaves.

**THE BARNACLE SCALE.***Ceroplastes cirripediformis* Comst.

(Food plants: Myrtle, orange, persimmon, quince.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., p. 150, 1903.

EXHIBIT: Infested leaves.

**THE SOFT SCALE.***Coccus hesperidum* Linn.

(Food plants: Laurel, lemon, myrtle, oleander, orange, etc.; formerly *Lecanium*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 168-170, 1903.

EXHIBIT: Infested twig.

**THE HEMISPHERICAL SCALE.***Saissetia hemisphaerica* Targ.

(Food plants: Oleander, orange, peach, etc.; formerly *Lecanium*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 202-203, 1903.

EXHIBIT: Infested twig.

**THE BLACK SCALE.***Saissetia oleæ* Bern.(Food plants: Apple, apricot, olive, orange, pear, plum, rose; formerly *Lecanium*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 205-206, 1903.

EXHIBIT: Infested twig.

**THE OLEANDER SCALE.***Aspidiotus hederae* Vall.(Food plants: Currant, box, cherry, olive, oleander, orange, etc.; formerly *A. nerii* Bouché.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 260-264, 1903.

EXHIBIT: Infested twig.

**THE ORANGE CHIONASPIS.***Chionaspis citri* Comst.

(Food plants: Euonymus, orange, palms.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bull. 88, Mass. Agr. Coll., pp. 214-215, 1903; Marlatt, Yearbook, U. S. Dept. Agric., 1900, p. 270, 1901.

EXHIBIT: Infested twig.

**THE RED SCALE OF CALIFORNIA.***Chrysomphalus aurantii* Mask.(Food plants: Agave, apple, fig, grape, lemon, orange, pear, plum, quince, willow, etc.; formerly *Aspidiotus*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bull. 88, Mass. Agr. Coll., pp. 287-288, 1903; Marlatt, Yearbook, U. S. Dept. Agric., 1900, p. 268, 1901.

EXHIBIT: Infested twig.

**THE CIRCULAR SCALE.***Chrysomphalus ficus* Ashm.(Food plants: Lemon, oleander, orange, palm, rose, etc.; formerly *Aspidiotus*.)For bibliography and food plants see *Chrysomphalus aonidum*, Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 286-287, 1903; Marlatt, Yearbook, U. S. Dept. Agric., 1900, p. 269, 1901.

EXHIBIT: Infested twig.

**THE PURPLE SCALE.***Lepidosaphes beckii* Newm.(Food plants: Citron, fig, lemon, oak, orange. Formerly *Mytilaspis citricola* Glov.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bull. 88, Mass. Agr. Coll., pp. 305-306, 1903; Marlatt, Yearbook, U. S. Dept. Agric., 1900, p. 261, 1901.

EXHIBIT: Infested twig.

**GLOVER'S SCALE; LONG SCALE.***Lepidosaphes gloveri* Pack.(Food plants: Lime, magnolia, orange, palms; formerly *Mytilaspis*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., p. 309, 1903; Marlatt, Yearbook, U. S. Dept. Agric., 1900, p. 265, 1901.

EXHIBIT: Infested twig.

**THE CHAFF SCALE.***Parlatoria pergandei* Comst.

(Food plants: Japonica, lemon, orange.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 319-320, 1903; Marlatt, Yearbook, U. S. Dept. Agric., 1900, p. 270, 1901.

EXHIBIT: Infested twigs.

**THE SAN JOSE SCALE.****THE SAN JOSE SCALE.***Aspidiotus perniciosus* Comst.

(Food plants: Almond, apple, apricot, birch, black walnut, black currant, catalpa, chestnut, crab-apple, crab-grass, cherry, grape, hickory, oak, peach, pear, persimmon, plum, poplar, prune, Rocky Mountain cherry, rose, silver maple, willow, and many other plants.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 271-275, 1903; Howard and Marlatt, Bul. 3, n. s., Div. Ent. U. S. Dept. Agric., 1896, 80 pp.

EXHIBIT: Infested twig, fruit, figures, and enemies: *Pentilia misella* Lec., adult and figure; *Chilocorus similis* Rossi, larva, pupa, adult, and figure; parasite, *Aphelinus diaspidis* How., adult and figure.

**INSECTS INJURIOUS TO APPLE.**

For special treatises on apple insects see Bruner, Trans. Nebr. St. Hort. Soc. f. 1894, pp. 155-223, 1895; Harvey and Munson, Bul. 56, Maine Agr. Expt. Sta., 1899; Saunders, Insects Injurious to Fruits, 2d ed., pp. 13-139, 1900.

**INJURING THE ROOTS.****THE WOOLLY APPLE APHIS.***Schizoneura lanigera* Hausm.

For general account see Marlatt, Cir. 20, Div. Ent., U. S. Dept. Agric., 1897.

EXHIBIT: Work, figure, parasite, *Aphelinus mali* Hal., and enemy, *Scymnus cervicalis* Muls.

**INJURING THE TRUNK.****FLAT-HEADED APPLE-TREE BORER.***Chrysobothris femorata* Fab.

For general account see Chittenden, Cir. 32, Div. Ent., U. S. Dept. Agric., pp. 9-12, 1898.

EXHIBIT: Adult, work, and figure.

**ROUND-HEADED APPLE-TREE BORER.***Superda candida* Fab.

For general account see Chittenden, Cir. 32, Div. Ent., U. S. Dept. Agric., pp. 1-8, 1898.

EXHIBIT: Adult, work, and figure.

**APPLE-WOOD STAINER; PIN-BORER.***Pterocyclon mali* Fitch.(Formerly *Monarthrum*.)

For general account of this and an allied species, *M. jasciatum* Say, see Hubbard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 26-28, 1897.

EXHIBIT: Adult and figure.

**INJURING THE BRANCHES.****THE APPLE-TREE PRUNER.***Elaphidion villosum* Fab.

For full account and food plants see Chittenden, Bul. 18, n. s., Div. Ent., U. S. Dept. Agric., pp. 35-40, 1898.

EXHIBIT: Adult, work, and figure.

**THE NEW YORK WEEVIL.***Ithycerus noveboracensis* Först.

For general account see Lugger, 5th Rpt. St. Ent. Minn., pp. 187-189, 1899.

EXHIBIT: Adult and work.

**THE APPLE TWIG-BORER.***Amphicerus bicaudatus* Say.

For general account see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 11-13, fig., 1898.

EXHIBIT: Adult, work, and figure.

**THE APPLE TWIG-BEETLE.***Stephanoderes hispidulus* Lec.

(Formerly *Hypothenemus*.)

EXHIBIT: Adult and work.

**PEAR-BLIGHT BEETLE; SHOT-BORER.***Xyleborus pyri* Peck.

(Formerly considered *X. dispar*.)

For general account see Hubbard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 22-23, 1897.

EXHIBIT: Adult and work.

**THE COSMOPOLITAN AMBROSIA BEETLE.***Xyleborus saxeseni* Ratz.

(Formerly *X. xylographus*.)

For general account see Hubbard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 24-26, 1897.

EXHIBIT: Adult.

**FRUIT-TREE BARK BEETLE; THE SHOT-HOLE BORER.***Scolytus rugulosus* Ratz.

For general account see Chittenden, Cir. 29, Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Adult and figure.

**THE BUFFALO TREE-HOPPER.***Ceresa bubalus* Fab.

For general account see Marlatt, Cir. 23, Div. Ent., U. S. Dept. Agric., 1897.

EXHIBIT: Adult, work, and figure.

**THE PERIODICAL CICADA.***Tibicen septendecim* Linn.

For life history and general article see Marlatt, Bul. 14, n. s., Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Pupa, pupa skins, and adult.

**THE SAN JOSE SCALE.***Aspidiotus perniciosus* Comst.

(Food plants: Almond, apple, apricot, birch, black walnut, black currant, catalpa, chestnut, crab-apple, crab-grass, cherry, grape, hickory, oak, peach, pear, persimmon,

plum, poplar, prune, Rocky Mountain cherry, rose, silver maple, willow, and many other plants.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 271-275, 1903; Howard and Marlatt, Bul. 3, n. s., Div. Ent., U. S. Dept. Agric., 1896. 80 pp.

EXHIBIT: Infested twig.

### **PUTNAM'S SCALE; CRANBERRY SCALE.**

*Aspidiotus ancylus* Putn.

(Food plants: Apple, apricot, box elder, cottonwood, cranberry, elm, hemlock, maple, oak, peach, pear, plum, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 252-253, 1903.

EXHIBIT: Infested twig.

### **THE CHERRY SCALE; FORBES' SCALE.**

*Aspidiotus forbesi* Johns.

(Food plants: Apple, cherry, currant, honey locust, peach, pear, plum, walnut, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 259-260, 1903.

EXHIBIT: Infested twig.

### **THE GREEDY SCALE.**

*Aspidiotus rapax* Comst.

(Food plants: Cottonwood, maple, olive, pear, quince, apple, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 276-278, 1903.

EXHIBIT: Infested twig.

### **THE EUROPEAN FRUIT-SCALE.**

*Aspidiotus ostreaformis* Curt.

(Food plants: Apple, cherry, maple, oak, peach, pear, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 268-270, 1903.

EXHIBIT: Infested twig.

### **THE SCURFY SCALE.**

*Chionaspis furfura* Fitch.

(Food plants: Apple, cherry, currant, elm, pear, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 217-219, 1903; Howard, Yearbook, U. S. Dept. Agric., 1894, pp. 259-261, figs.; Banks, Bul. 34, Div. Ent., U. S. Dept. Agric., p. 14, 1902.

EXHIBIT: Infested twig.

### **OYSTER-SHELL SCALE.**

*Lepidosaphes ulmi* Linn.

(Attacks principally apple, currant, Cornus, cottonwood, lilac, pear, sassafras, etc. Formerly *Mytilaspis pomorum* Bouché.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 314-317, 1903.

EXHIBIT: Infested twig.

### **THE BLACK SCALE.**

*Saissetia oleæ* Bern.

(Food plants: Apple, apricot, olive, orange, pear, plum, rose; formerly *Lecanium*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 205-206, 1903.

EXHIBIT: Infested twig.

**INJURING THE LEAVES.****PISTOL CASE-BEARER.***Coleophora malivorella* Riley.

(Feeds on leaves and buds.)

For general account see Slingerland, Bul. 124, Cornell Univ. Agr. Expt. Sta., 1897.

EXHIBIT: Cocoon, adult, work, and figure.

**EYE-SPOTTED BUD-MOTH.***Tmetocera ocellana* Schiff.

(Feeds on buds and young leaves.)

For general account see Slingerland, Bul. 50, Cornell Univ. Agr. Expt. Sta., 1893.

EXHIBIT: Pupa, adult, and work.

**APPLE-TREE BUCCULATRIX.***Bucculatrix pomifoliella* Clem.

For general account and partial bibliography see Slingerland and Fletcher, Bul. 214, Cornell Univ. Agr. Expt. Sta., pp. 69-78, figs., 1903.

EXHIBIT: Cocoon, adult, and figure.

**THE RESPLENDENT SHIELD-BEARER.***Coptodisca splendoriferella* Clem.

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 263-265, 1899.

EXHIBIT: Cocoon, adult, work, and figure.

**CHAPIN'S APPLE-LEAF SEWER.***Ancylis nubeculana* Clem.

For brief article see Lugger, 4th Rpt. St. Ent. Minn., pp. 239-240, 1899.

EXHIBIT: Pupa, adult, work, and figure.

**THE OBLIQUE-BANDED LEAF-ROLLER.***Archips rosaceana* Harr.(Formerly *Cacœcia*.)

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 226-227, 1899.

EXHIBIT: Pupa, adult, and work.

**THE LESSER APPLE LEAF-FOLDER.***Acleris minuta* Rob.(Formerly *Teras*.)

For general account see J. B. Smith, Farmers' Bul. 178, U. S. Dept. Agric., pp. 12-17, 1903.

EXHIBIT: Pupa and adult.

**THE LEAF CRUMPLER.***Mineola indiginella* Zell.

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 211-213, 1899.

EXHIBIT: Cocoon, pupa, adult, and figure.

**THE APPLE-LEAF SKELETONIZER.***Canarsia hammondi* Riley.

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 217-218, 1899.

EXHIBIT: Pupa, adult, and work.

**APPLE-TREE TENT-CATERPILLAR.***Malacosoma americana* Fab.(Formerly *Clisiocampa*.)

For life history and bibliography see Felt, 14th Rpt. St. Ent., N. Y., pp. 177-190, 1898.

EXHIBIT: Eggs, larva, cocoon, pupa, adult, and work, and the parasites *Pimpla conquisitor* Say, and *Ichneumon latus* Brullé.

**THE LIME-TREE WINTER-MOTH.***Erannis tiliaria* Harr.(Formerly *Hibernia*.)

For general account see Lugg, 4th Rpt. St. Ent. Minn., pp. 193-195, 1899.

EXHIBIT: Pupa, adult, and figure.

**THE ELM SPANWORM.***Ennomos subsignarius* Hbn.

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 232-233, 306-307, 1890.

EXHIBIT: Eggs, larva, pupa, and work.

**THE APPLE LEAF-MINER.***Tischeria malifoliella* Clem.

For life history and bibliography see Lintner, 11th Rpt. N. Y. St. Ent., pp. 160-162, 1896.

EXHIBIT: Adult and work.

**THE SPRING CANCKER-WORM.***Paleacrita vernata* Peck.

For general account see Coquillett, Cir. 9, Div. Ent., U. S. Dept. Agric., pp. 1-3, 1895.

EXHIBIT: Larva, adult, and figure.

**THE FALL CANCKER-WORM.***Alsophila pometaria* Harr.(Formerly *Anisopteryx*.)

For general account see Coquillett, Cir. 9, Div. Ent., U. S. Dept. Agric., pp. 3-4, 1895.

EXHIBIT: Eggs, larva, cocoon, adult, and figure.

**THE WHITE-MARKED TUSSOCK-CATERPILLAR.***Hemerocampa leucostigma* S. & A.(Larvæ feed extensively upon fruit and shade trees and often damage shrubs and vines; formerly *Orgyia*.)

For general account of this insect and its parasites see Howard, Tech. Ser., 5, Div. Ent., U. S. Dept. Agric., 1897; for life history, etc., Howard, Farmers' Bul. 99, pp. 12-20, 1899.

EXHIBIT: Egg-masses, larva, and adult.

**THE FALL WEBWORM.***Hyphantria cunea* Dru.

For general account see Howard, Farmers' Bul. 99, U. S. Dept. Agric., pp. 20-25, 1899.

EXHIBIT: Larva, pupa, adult, and work.

**THE COMMON BAGWORM.***Thyridopteryx ephemeraeformis* Steph.

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 258-262, 1890.

EXHIBIT: Cocoons and figure.

**IO MOTH.***Automeris io* Fab.

For general account see Lugg, 4th Rpt. State Ent. Minn., pp. 126-129, fig. 130, and pl. 16, fig. 129, 1899.

EXHIBIT: Adult.



**THE BROWN-TAIL MOTH.***Euproctis chrysorrhæa* Linn.

For life history and general article see Fernald and Kirkland, Spec. Bul. Hatch. Expt. Sta., Mass., 15 pp., 1 fig., 3 pls., 1898; Marlatt, Circ. 58, Bur. Ent., U. S. Dept. Agric., 1905.

EXHIBIT: Larva, adult, and figure.

**THE GYPSY MOTH.***Porthetria dispar* Linn.

(Formerly *Ocnèria*.)

For life history, habits, and general account see Forbush and Fernald, "The Gypsy Moth," 495 pp. + i-c, 1896; Howard, Bul. 11, n. s., Div. Ent., U. S. Dept. Agric., 1897; Marlatt, Circ. 58, Bur. Ent., U. S. Dept. Agric., 1905.

EXHIBIT: Larva, adult, and figure.

**THE CLIMBING CUTWORM.***Euxoa scandens* Riley.

(Formerly *Carneades*.)

For general account see Slingerland, Bul. 104, Cornell Univ. Agr. Expt. Sta., pp. 567-569, Pl. I, 1895.

EXHIBIT: Adult.

**THE CECROPIA MOTH.***Samia cecropia* Linn.

For general account see Riley, 4th Rpt. Ins. Mo., pp. 103-111, 1872.

EXHIBIT: Larva, cocoon, and adult.

**APPLE APHIS.***Aphis pomi* Linn.

For general account as *Aphis mali* see Smith, Bul. 143, N. J. Agr. Expt. Sta., 1900.

For general article treating of several species occurring on apple see Pergande, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 5-23, 1904.

EXHIBIT: Work and figure and the following enemies: *Adalia bipunctata* L., *Anatis 15-punctata* Ol., *Coccinella novemnotata* Hbst., *C. sanguinea* L., *Harmonia micta* Rand., *Hippodamia convergens* Guen., and *H. 13-punctata* L.

**THE IMBRICATED SNOUT-BEETLE.***Epicærus imbricatus* Say.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 28-29, 1903, and Bul. 19, n. s., pp. 62-67, 1899.

EXHIBIT: Adult.

**SYNETA ALBIDA** Lec.

For brief notice see Riley and Howard, Insect Life, Vol. IV, p. 396, 1892.

EXHIBIT: Adult and work.

**RED-LEGGED FLEA-BEETLE.***Crepidodera rufipes* Linn.

For general article see Insect Life, Vol. V, pp. 334-342, 1893.

EXHIBIT: Adult.

**THE APPLE-LEAF FLEA-WEEVIL.***Orchestes pallicornis* Say.

For short account of life history see Forbes, Trans. Ill. St. Hort. Soc. f. 1901, p. 147, 1902.

EXHIBIT: Adult.

## INJURING THE FRUIT. TEN-SPOTTED XANTHONIA.

*Xanthonia decemnotata* Say.

EXHIBIT: Adult and work.

## THE INDIAN EUPHORIA.

*Euphoria inda* Linn.

For life history and general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 67-74, 1899.

EXHIBIT: Adult and work.

## JUNE BEETLE; FIG EATER.

*Allorhina nitida* Linn.

For general account see Howard Bul. 10, n. s., Div. Ent., U. S. Dept. Agric., pp. 20-26, 1898.

EXHIBIT: Adult.

## CODLING MOTH; APPLE WORM.

*Carpocapsa pomonella* Linn.

For full bibliography, life history, and illustrations see Simpson, Bul. 41, Div. Ent. U. S. Dept. Agric., 105 pp., figs., 1903.

EXHIBIT: Full life history (larva, pupa, cocoons, and adult) and parasites: *Pimpla annulipes* Brullé and *P. conquisitor* Say. Enemies: *Chauliognathus pennsylvanicus* DeG. and *Telephorus bilineatus* Say.

## THE GREEN FRUIT-WORMS.

The following three species of *Xylina* are commonly known as green fruit-worms. For general account see Slingerland, Bul. 123, Cornell Univ. Agr. Expt. Sta., 1896.

*Xylina antennata* Walk.

EXHIBIT: Adult and figure.

*Xylina grotei* Riley.

EXHIBIT: Adult and figure.

*Xylina laticinerea* Grote.

EXHIBIT: Adult and figure.

## ILLUSTRATION SHOWING WORK OF A TORTRICID ON APPLE.

(The larva mines in, and feeds beneath, the skin of the fruit.)

## THE PLUM CURCULIO.

*Conotrachelus nenuphar* Hbst.

For general account and bibliography see Lintner, 7th Rpt. N. Y. St. Ent., pp. 288-296, 1891.

EXHIBIT: Adult and figure.

## THE APPLE CURCULIO.

*Anthonomus quadrigibbus* Say.

For general account see Gillette, Bul. 11, Iowa Agric. Expt. Sta., pp. 492-494, 1890.

EXHIBIT: Adult and figure.

## THE APPLE-FRUIT MAGGOT.

*Rhagoletis pomonella* Walsh.

(Formerly *Trypeta*.)

For life history see Harvey, Rpt. Maine Agr. Expt. Sta., p. 190, 1889; Banks, Bul. 34, Div. Ent., U. S. Dept. Agric., p. 45, 1902.

EXHIBIT: Puparium, adult, and figure.

**INSECTS INJURIOUS TO PEACH.**

Saunders, Insects Injurious to Fruits, 2d edit., pp. 191-200, 1900.

**THE NATIVE PEACH BARK-BEETLE.**

*Phloeophthorus liminaris* Harr.

(Formerly *Phloeotribus*.)

For general account see Lintner, 9th Rpt. N. Y. St. Ent., pp. 365-368, 1893.

EXHIBIT: Adult and work.

**THE FRUIT-TREE BARK-BEETLE.**

*Scolytus rugulosus* Ratz.

For general account see Chittenden, Cir. 29, Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Adult, work, figure, and the parasite *Cheirpachys colon* Linn.

**THE PEACH BORER.**

*Sanninoidea exitiosa* Say.

(Formerly *Sannina*.)

For general account see Marlatt, Cir. 17, Div. Ent., U. S. Dept. Agric., 1896.

EXHIBIT: Pupa, cocoon, adult, and figure.

**THE PERIODICAL CICADA.**

*Tibicen septendecim* Linn.

(Injures, by deposition of eggs in the twigs, almost all fruit, shade, and forest trees.)

For life history and general article see Marlatt, Bul. 14, n. s., Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Pupa, adult, and enemy *Sphecius speciosus* Dru.

**THE BLUE-SPANGLED PEACH-MOTH.**

*Haploa lecontei* Bois.

(Formerly *Callimorpha*.)

For general account see Saunders, Insects Injurious to Fruits, 2d edit., pp. 197-199, 1900.

EXHIBIT: Adult.

**THE PEACH-TWIG MOTH.**

*Anarsia lineatella* Zell.

For general article with bibliography see Marlatt, Bul. 10, n. s., Div. Ent., U. S. Dept. Agric., pp. 7-20, 1898.

EXHIBIT: Pupa, adult, work, and figure.

**THE INDIAN FRUIT-FLY.**

*Ceratitis capitata* Wied.

For general article see Riley, Rpt. U. S. Dept. Agric., 1890, pp. 255-257.

EXHIBIT: Pupa, adult, and figure.

**THE PEACH SCALE.**

*Eulecanium persicæ* Fab.

(Food plants: Peach, plum, quince, etc.; formerly *Lecanium*.)

For bibliography, food plants, and distribution see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 191-193, 1903.

EXHIBIT: Infested twig.

**PUTNAM'S SCALE; CRANBERRY SCALE.**

*Aspidiotus ancyclus* Putn.

(Food plants: Apple, apricot, box-elder, cottonwood, cranberry, elm, hemlock, maple, oak, peach, pear, plum, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 252-253, 1903.

EXHIBIT: Infested twig.

**THE SAN JOSE SCALE.***Aspidiotus perniciosus* Comst.

(Food plants: Almond, apple, apricot, birch, black walnut, black currant, catalpa, chestnut, crab-apple, crab-grass, cherry, grape, hickory, oak, peach, pear, persimmon, plum, poplar, prune, Rocky Mountain cherry, rose, silver maple, willow, and many other plants.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 271-275, 1903; Howard and Marlatt, Bul. 3, n. s., Div. Ent., U. S. Dept. Agric., 1896, 80 pp.

EXHIBIT: Infested twig.

**THE CHERRY LEAF-BEETLE.***Galerucella cavicollis* Lec.

For general article and distribution see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 90-93, 1899.

EXHIBIT: Adult.

**THE CHERRY-FRUIT MAGGOT.***Rhagoletis cingulata* Loew.

For detailed account see Slingerland, Bul. 172, Cornell Univ. Agr. Exp. Sta., 41 pp., 6 figs., 1899; Chittenden, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 70-75, 1904.

EXHIBIT: Adult.

**INSECTS INJURIOUS TO PEAR.**

(Many of the insects injuring the apple will be found attacking the pear.)

**THE FRUIT-TREE BARK-BEETLE.***Scolytus rugulosus* Ratz.

For general account see Chittenden, Cir. 29, Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Adult, work, and figure.

**PEAR-BLIGHT BEETLE; SHOT-BORER.***Xyleborus pyri* Peck.

(Formerly *X. dispar*.)

For general account see Hubbard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 22-23, 1897.

EXHIBIT: Adult, work, and figure.

**THE PEAR BLISTER MITE.***Eriophyes pyri* Pagenst.

For detailed account see Slingerland, Bul. 61, Cornell Univ. Agr. Exp. Sta., pp. 317-328, figs., 1893.

EXHIBIT: Work and figure.

**THE PEAR PSYLLA.***Psylla pyri* Linn.

(Formerly *P. pyricola*.)

For general accounts see Slingerland, Bul. 44, Cornell Univ. Agr. Sta., 1892; Marlatt, Cir. 7, Div. Ent., U. S. Dept. Agric., 1895.

EXHIBIT: Adult and figure.

**THE PEAR SLUG.***Eriocampoides limacina* Retz.

(Formerly *Eriocampa cerasi*.)

For general account see Marlatt, Cir. 28, Div. Ent., U. S. Dept. Agric., 1897.

EXHIBIT: Adult, work, and figure.

**THE SCURFY SCALE.***Chionaspis furfura* Fitch.

(Food plants: Apple, cherry, currant, elm, pear, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 217-219, 1903; Howard, Yearbook, U. S. Dept. Agric., 1894, pp. 259-261, figs.; Banks, Bul. 34, Div. Ent., U. S. Dept. Agric., p. 14, 1902.

EXHIBIT: Infested twig.

**SINUATE PEAR-BORER.***Agrilus sinuatus* Ol.

For general accounts see Smith, Rpt. Entom. N. J. Agr. Exp. Sta. f. 1894, pp. 556-561, 1895; Banks, Bul. 34, Div. Ent., U. S. Dept. Agric., pp. 40-41, 1902.

EXHIBIT: Adult and figure.

**INSECTS INJURIOUS TO PLUM.****THE PLUM CURCULIO.***Conotrachelus nenuphar* Hbst.

For general account and bibliography see Lintner, 7th Rpt. N. Y. St. Ent., pp. 288-296, 1891.

EXHIBIT: Adult, figure, and enemies, *Aspidoglossa subangulata* Chd., *Chauliognathus pennsylvanicus* DeG., *Harpalus caliginosus* Fab., and parasite *Sigalphus curculionis* Fitch.

**THE PLUM GOUGER.***Anthonomus scutellaris* Lec.(Formerly *Coccotorus prunicida* Walsh.)

For general accounts see Riley and Howard, Insect Life, Vol. II, pp. 258-259, 1890; Gillette, Bul. 47, Colo. Agr. Exp. Sta., pp. 20-22, 1898.

EXHIBIT: Adult, work, and figure.

**THE HOP APHIS.***Phorodon humuli* Schr.

(Attacks hop and plum.)

For full life history see Riley, Cir. 2, Div. Ent., U. S. Dept. Agric., 1891.

EXHIBIT: Adult and work.

**FORBES' SCALE; CHERRY SCALE.***Aspidiotus forbesi* Johns.

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 259-260, 1903.

EXHIBIT: Infested twig.

**INSECTS INJURIOUS TO GRAPE.**

For the more important grape insects see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., 1898; Saunders, Insects Injurious to Fruits, 2d edition, pp. 227-302, 1900; Bruner, Nebr. State Hort. Soc. Rept. f. 1895, pp. 69-162, 1896.

**INJURING THE ROOTS.****THE TILE-HORNED PRIONUS.***Prionus imbricornis* Linn.

For general account of *Prionus* species see Lugger, 5th Rpt. St. Ent. Minn., pp. 110-111, 1899.

EXHIBIT: Adult.

**THE GRAPEVINE ROOT-BORER.***Memythrus polistiformis* Harr.(Formerly *Sciapteron*.)

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 55-57, 1899.

EXHIBIT: Figures.

**INJURING LEAVES AND ROOTS.****GRAPE PHYLLOXERA.***Phylloxera vastatrix* Planch.

For general article see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 4-9, figs., 1898.

EXHIBIT: Work and figure.

**INJURING THE STEMS AND BRANCHES.****COTTONY MAPLE SCALE.***Pulvinaria innumerabilis* Rathv.

(Foot-plants: Alder, apple, box-elder, elm, grape, linden, maples, pear, willow, etc.)  
For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 134-135, 1903; Howard, Bul. 22, n. s., Div. Ent., U. S. Dept. Agric., pp. 8-16, figs. 4, 1900.

EXHIBIT: Infested twig.

**THE GRAPE SCALE.***Aspidiotus uvæ* Comst.

(Food-plants: Ampelopsis, grape, hickory.)

For bibliography see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., p. 280, 1903.

EXHIBIT: Infested twig.

**THE APPLE TWIG-BORER.***Amphicerus bicaudatus* Say.

For general account see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 11-13, figure, 1898.

EXHIBIT: Adult and figure.

**RED-SHOULDERED TWIG-BORER.***Sinoxylon basilaris* Say.

• For general account see Lugg, 5th Rpt. St. Ent. Minn., pp. 70-72, 1899.

EXHIBIT: Adult and figure.

**THE SNOWY TREE-CRICKET.***Ecanthus niveus* DeG.

For general account see Lugg, 3d Rpt. St. Ent. Minn., pp. 269-271, 1898.

EXHIBIT: Adult and figure.

**ÆCANTHUS LATIPENNIS** Riley.

For brief article see Lugg, 3d Rpt. St. Ent. Minn., p. 273, 1898.

EXHIBIT: Adult.

**GRAPE-VINE ROOT-WORM.***Fidia viticida* Walsh.

For life history and bibliography see Felt, Bul. 72, N. Y. St. Museum, 1903, 55 pp., with colored plate.

EXHIBIT: Adult and figure.

**GRAPE-VINE FIDIA.***Fidia longipes* Mels.

EXHIBIT: Adult.

**INJURING THE LEAVES.****ACHEMON SPHINX.***Pholus achemon* Dru.

(Formerly *Philampelus*.)

For general account see Lugg, 4th Rpt. State Ent. Minn., pp. 38-40, 1899.

EXHIBIT: Larva and adult.

**GRAPE-VINE HOG-CATERPILLAR.***Ampelophaga myron* Cram.

For general account see Lugger, 4th Rpt. State Ent. Minn., pp. 42-45, 1899.

EXHIBIT: Larva and adult.

**ABBOT'S SPHINX.***Sphæcodina abbotii* Swaine.(Formerly *Thyreus*.)

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 32-33, 1899.

EXHIBIT: Larva and adult.

**LARGE BEAUTIFUL WOOD NYMPH.***Euthisanotia grata* Fab.(Formerly *Eudryas*.)

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 69-71, 1899.

EXHIBIT: Larva and adult.

**SMALL BEAUTIFUL WOOD NYMPH.***Euthisanotia unio* Hübn.

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 71-72, 1899.

EXHIBIT: Larva and adult.

**EIGHT-SPOTTED FORESTER.***Alypia octomaculata* Fab.

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 66-67, 1899.

EXHIBIT: Larva and adult.

**SOCIAL GRAPE CATERPILLAR.***Harrisina americana* Guer.(Formerly *Procris*.)

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 72-74, 1899.

EXHIBIT: Adult and figure.

**GRAPE LEAF-FOLDER.***Desmia funeralis* Hübn.

For general account see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 16-17, 1898.

EXHIBIT: Larva, adult, and work.

**GRAPE-VINE PLUME-MOTH.***Oxyptilus periscelidactylus* Fitch.

For general article see Lugger, 4th Rpt. St. Ent. Minn., pp. 221-222, 1899; for bibliography and article see Lintner, 12th Rpt. St. Ent. N. Y., pp. 218-222, 1897.

EXHIBIT: Larva and adult.

**GRAPE-VINE SAW-FLY.***Blennocampa pygmaea* Say.

For general articles see Harris, Insects Injurious to Vegetation, pp. 522-525; Beach, Lowe, and Stewart, Bul. 170, N. Y. Agric. Expt. Sta., p. 417, 1899.

EXHIBIT: Adult and figure.

**GRAPE-VINE FLEA-BEETLE.***Haltica chalybea* Ill.

For general articles see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 13-14, 1898; Slingerland, Bul. 157, Cornell Univ. Agr. Expt. Sta., N. Y., 1898. For additional food plants see Lugger, 5th Rpt. St. Ent. Minn., pp. 157-159, 1899.

EXHIBIT: Adult and figure.

**THE GRAPE-VINE COLASPIS.***Colaspis brunnea* Fab.

For general article see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 13-14, 1903.

EXHIBIT: Adult.

**THE VARIED ANOMALA.***Anomala varians* Burm.

EXHIBIT: Adult.

**THE GRAPE-VINE LEAF-HOPPER.***Typhlocyba comes* Say.

For general article see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 18-20, 1898, under *Typhlocyba citifera*. For full life history and general account see Slingerland, Bul. 215, Cornell Univ. Agr. Expt. Sta., 1904.

EXHIBIT: Adult and figure.

**THE WAVED SHARPSHOOTER.***Oncometopia undata* Fab.

(Formerly *Proconia*.)

For general article see Lugg, 6th Rpt. St. Ent. Minn., pp. 136-137, 1900.

EXHIBIT: Adult.

**INJURING THE FRUIT.****THE GRAPE-SEED WORM.***Evoxyssoma vitis* Saunders.

(Formerly *Isozona*.)

For general account see Saunders, Insects Injurious to Fruits, 2d ed., pp. 296-297, 1900.

EXHIBIT: Adult.

**THE GRAPE FRUIT-MOTH.***Polychrosis botrana* Schiff.

(Formerly *Eudemis*.)

For general article see Marlatt, Farmers' Bul. 70, U. S. Dept. Agric., pp. 20-22, 1898.

EXHIBIT: Adult and figure.

**THE GRAPE SEED-WEEVIL.***Craponius inaequalis* Say.

For general accounts see Saunders, Insects Injurious to Fruits, 2d ed., pp. 300-301, 1900; Lintner, 9th Rpt. N. Y. St. Ent., pp. 364-365, 1893.

EXHIBIT: Adult and figure.

**INSECTS INJURIOUS TO STRAWBERRY.**

For general articles treating of these insects see Forbes, 13th Rpt. Ill. St. Ent., pp. 60-180, 1884; Saunders, Insects Injurious to Fruits, 2d ed., pp. 321-335, 1900.

**INJURING THE ROOTS AND CROWN.****THE STRAWBERRY CROWN-GIRDLER.***Otiorynchus ovatus* Linn.

For brief bibliography and account see Lintner, 10th Rpt. St. Ent. N. Y., pp. 416-419, 1895.

EXHIBIT: Adult.

**THE STRAWBERRY CROWN-BORER.***Tyloderma fragariae* Riley.

For detailed accounts see Forbes, 12th Rpt. Ill. St. Ent., pp. 64-75, 1883; 13th Rpt., p. 142, 1884.

EXHIBIT: Adult, work, and figure.



**STRAWBERRY CROWN MOTH.***Egeria rutilans* Hy. Edw.(Formerly *Sesia*.)

For general account see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 85-90, 1900.

EXHIBIT: Adult, pupa, and work.

**THE SPOTTED STRAWBERRY LEAF-BEETLE.***Typophorus canellus* Fab.

For general account see Forbes, 13th Rpt. St. Ent. Ill., pp. 159-163, 1884.

EXHIBIT: Adult.

**INJURING THE ROOTS.****WHITE GRUB; JUNE BEETLE.***Lachnosterna arcuata* Sm.

For general account see Chittenden, Bul. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 74-76, 1901.

EXHIBIT: Adult and figure.

**THE STRAWBERRY ROOT-BORER.***Graphops nebulosus* Lec.

For brief notice see Garman, Bul. 31, Ky. Agric. Exp. Sta., p. 23, 1890.

EXHIBIT: Adult.

**INJURING THE LEAVES.****THE STRAWBERRY FALSE-WORM.***Harpiphorus maculatus* Nort.

For general account see Harrington, Insect Life, Vol. II, pp. 227-228, 1890.

EXHIBIT: Larva, pupa, adult, work, and figure.

**THE STRAWBERRY LEAF-CHAFER.***Diplotaxis frondicola* Say.

For brief account see Kridelbaugh, Ann. Rpt. Ia. St. Hort. Soc., 1871, p. 161, 1872

EXHIBIT: Adult and work.

**THE STRAWBERRY FLEA-BEETLE.***Haltica ignita* Ill.

For general account see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 70-78, 1900.

EXHIBIT: Adult.

**THE ROSE LEAF-BEETLE.***Nodonota puncticollis* Say.

For general account see Chittenden, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 60-61, 1897.

EXHIBIT: Adult.

**THE DUSKY PLANT-BUG.***Calocoris rapidus* Say.

For short account see Lugger, 1st Rpt. St. Ent. Minn., p. 65, 1900.

EXHIBIT: Adult.

**RASPBERRY LEAF-ROLLER.***Exartema permundana* Clem.

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 312-313, 1890.

EXHIBIT: Adult.

**THE STRAWBERRY LEAF-ROLLER.***Ancylis comptana* Fröhl.(Formerly *Phoxopteris*.)

For general account see Smith, Bul. 149, N. J. Agric. Expt. Sta., pp. 3-12, 1901.

EXHIBIT: Larva, pupa, adult, and figure.

**THE SMEARED DAGGER.***Apatela oblongata* S. & A.(Formerly *Acronycta*.)

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 567-568, 1890.

EXHIBIT: Larva, adult, and figure.

**INJURING THE BUDS AND STEMS.****THE STRAWBERRY WEEVIL.***Anthonomus signatus* Say.

(Lays eggs in buds and severs stems.)

For general account see Chittenden, Cir. 21, Div. Ent., U. S. Dept. Agric., 1897.

EXHIBIT: Adult, work, figure, and the parasites *Calyptus tibiator* Cr. and *Catolaccus incertus* Ashm.**INSECTS INJURIOUS TO BLACKBERRY AND RASPBERRY.**

For general articles see Webster, Bul. 45, Ohio Agric. Expt. Sta., pp. 151-217, 1893; Saunders, Insects Injurious to Fruits, 2d edit., pp. 303-320, 1900.

**INJURING THE ROOTS.****THE RASPBERRY ROOT-BORER.***Bembecia marginata* Harr.

For general account see Smith, Spec. Bul. N, N. J. Agric. Expt. Sta., pp. 9-12, 1891.

EXHIBIT: Larva and adult.

**INJURING THE STEMS.****BLACKBERRY GALL-MAKER.***Diastrophus turgidus* Bass.(Formerly *D. nebulosus* O. S.)

For brief article see Saunders, Insects Injurious to Fruits, 2d ed., pp. 318-319, 1900.

EXHIBIT: Adult and figure.

**RASPBERRY CANE-BORER.***Oberea bimaculata* Ol.

For bibliography and general account see Lintner, 5th Rpt. N. Y. St. Ent., pp. 231-233, 1889.

EXHIBIT: Adult and work.

**THE SNOWY TREE-CRICKET.***Ecanthus niveus* DeG.

For general account see Luger, 3d Rpt. St. Ent. Minn., pp. 269-271, 1898.

EXHIBIT: Adult, work, and figure.

**RED-NECKED CANE-BORER.***Agrilus ruficollis* Fab.

For general account see Smith, Spec. Bul. N, N. J. Agric. Expt. Sta., pp. 4-8, 1891.

EXHIBIT: Adult, work, and figure.

**INJURING THE LEAVES.****THE RASPBERRY SAWFLY.***Monophadnoides rubi* Harris.(Formerly *Monophadnus*.)

For bibliography and general account see Lowe, Bul. 150, N. Y. Agric. Expt. Sta., pp. 249-262, pls. IV-VI, 1898.

EXHIBIT: Larva, adult, and work.

**RASPBERRY LEAF-ROLLER.***Exartema permundana* Clem.

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 312-313, 1890.

EXHIBIT: Adult.

**THE FALL WEBWORM.***Hyphantria cunea* Dru.

(Feeds on leaves of various trees, shrubs, and vines.)

For general account see Howard, Farmers' Bul. 99, U. S. Dept. Agric., pp. 20-25, 1899.

EXHIBIT: Adult and figure.

**THE SMEARED DAGGER.***Apatela oblonga* S. & A.(Formerly *Acronycta*.)

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 567-568, 1890.

EXHIBIT: Larva and adult.

**STRAWBERRY LEAF-ROLLER.***Ancylis comptana* Fröhl.(Formerly *Phoxopteris*.)

For general account see Smith, Bul. 149, N. J. Agric. Expt. Sta., pp. 3-12, 1901.

EXHIBIT: Pupa and adult.

**THE FOUR-MARKED LEAF-BEETLE.***Cryptocephalus quadrimaculatus* Say.

EXHIBIT: Adult.

**THE HOODED PLANT-BUG.***Euthoctha galeator* Fab.

For brief notices see Riley and Howard, Insect Life, Vol. I, p. 54, 1888; p. 366, 1889.

EXHIBIT: Eggs, nymph, and adult.

**INJURING THE FRUIT.****RASPBERRY SPAN-WORM.***Synchlora ærata* Fab.(Formerly *S. glaucaria*.)

For bibliography and general account see Lintner, 8th Rpt. St. Ent. N. Y., pp. 129-133, 1893.

EXHIBIT: Pupa, adult, and figure.

**THE LITTLE NEGRO BUG.***Corimelaena pulicaria* Germ.

For general account see Lintner, 8th Rpt. St. Ent. N. Y., pp. 213-214, 1893.

EXHIBIT: Adult and figure.

## INSECTS INJURIOUS TO CURRANT AND GOOSEBERRY.

For general article on insects affecting currant and gooseberry see Piper and Doane, Bul. 36, Washington Agr. Expt. Sta., 1898.

### INJURING THE STEMS.

#### THE TERRAPIN SCALE.

*Eulecanium nigrofasciatum* Perg.

(Food plants: Apple, birch, linden, maple, peach, plum, sycamore; formerly *Lecanium*.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., p. 191, 1903; Pergande, Bul. 18, n. s., Div. Ent., U. S. Dept. Agr., pp. 26-29, figs., 1898.

EXHIBIT: Infested twig.

#### THE NATIVE CURRANT STEM-BORER.

*Psenocerus supernotatus* Say.

For general account see Lugger, 5th Rpt. State Entom. of Minnesota, pp. 121-122, 1899.

EXHIBIT: Adult and work.

#### CURRANT CLEARWING MOTH; IMPORTED CURRANT-BORER.

*Ageria tipuliformis* Clerck.

For general account see Lugger, 4th Rpt. State Entom. Minn., pp. 60-64, 1899.

EXHIBIT: Adult and work.

#### PUTNAM'S SCALE; CRANBERRY SCALE.

*Aspidiotus ancyllus* Putn.

(Food plants: Apple, apricot, box-elder, cottonwood, cranberry, elm, hemlock, maple, oak, peach, pear, plum, etc.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 252-253, 1903.

EXHIBIT: Infested twig.

#### THE SAN JOSE SCALE.

*Aspidiotus perniciosus* Comst.

(Food plants: Almond, apple, apricot, birch, black walnut, black currant, catalpa, chestnut, crab-apple, crab-grass, cherry, grape, hickory, oak, peach, pear, persimmon, plum, poplar, prune, Rocky Mountain cherry, rose, silver maple, willow, and many other plants.)

For bibliography and food plants see Fernald, Cat. Coccidæ of World, Bul. 88, Mass. Agr. Coll., pp. 271-275, 1903; Howard and Marlatt, Bul. 3, n. s., Div. Ent., U. S. Dept. Agr., 1896. 80 pp.

EXHIBIT: Infested twig.

#### THE BLACK GOOSEBERRY BORER.

*Xylocrius agassizii* Lec.

For general accounts see Fletcher, Rpt. of Ent. and Bot. for 1898, Can. Dept. Agric., pp. 207-210, 1899; Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 90-92, 1900.

EXHIBIT: Adult and figure.

### INJURING THE LEAVES.

#### GOOSEBERRY SPANWORM.

*Cymatophora ribearia* Fitch.

(Formerly *Eufitchia*.)

For short account see Lugger, 4th Rpt. State Ent. Minn., pp. 184-186, 1899.

EXHIBIT: Eggs, larva, pupa, adult, and figure.

**IMPORTED CURRANT WORM.***Pteronus ribesii* Scop.(Formerly *Nematus ventricosus*.)

For bibliography and technical description see Marlatt, Tech. Series 3, Div. Entom., U. S. Dept. Agric., pp. 61-63, 1896.

EXHIBIT: Adult, figure, and an enemy, *Podisus placidus* Uhl.**THE NATIVE CURRANT WORM.***Pristiphora grossulariæ* Walsh.For bibliography see *Gymnonychus appendiculatus* Htg., Marlatt, Tech. Series 3, Div. Entom., U. S. Dept. Agric., p. 124, 1896.

EXHIBIT: Adult and figure.

**THE CRANBERRY LOOPER.***Xanthotype crocataria* Fab.

For general account see Lugg, 4th Rpt. State Ent. Minn., pp. 178-179, 1899.

EXHIBIT: Larva and adult.

**POLYGONIA PROGNE Cram.**(Formerly *Grapta*.)

For general account see Packard, 5th Rpt. U. S. Entom. Comm., pp. 241, 1890.

EXHIBIT: Larva, chrysalis, and adult.

**INJURING THE FRUIT.****GOOSEBERRY FRUIT-WORM.***Zophodia grossulariæ* Pack.

For general account see Lugg, 4th Rpt. State Ent. Minn., pp. 214-216, 1899.

EXHIBIT: Pupa and adult.

**INSECTS INJURIOUS TO GRASSES.****APANTESIS NAIS Dru.**(Formerly *Arctia*.)

For account see Beutenmüller, "Cat. Lep. N. Y.," Ann. Acad. N. Y., p. 206, 1890.

EXHIBIT: Adult.

**GRANULATED CUTWORM.***Feltia annexa* Fr.

For general account see Riley, Rpt. U. S. Dept. Agric., 1884, pp. 291-292, 1885.

For description and stages see French, Can. Ent., Vol. XIV, pp. 207-210, 1882.

EXHIBIT: Adult and figure.

**HOMOPTERA EDUSA Dru.**

-EXHIBIT: Larva, pupa, and adult.

**NORTHERN GRASS WORM.***Drasteria erectea* Cram.

For general account see Slingerland, Insect Life, Vol. V, pp. 87-88, 1892.

EXHIBIT: Larva, pupa, adult, and work.

**THE ARMY WORM.***Heliophila unipuncta* Harv.(Formerly *Leucania*.)

For bibliography and life history see Lintner, 12th Rpt., St. Ent. N. Y., pp. 190-214, 1896.

EXHIBIT: Larva, pupa, adult, and figure.

**THE SALT-MARSH CATERPILLAR.***Estigmene acrea* Dru.(Formerly *Leucartia*.)

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 43-44, 1903.

EXHIBIT: Larva and adult.

**FALL ARMY WORM.***Laphygma frugiperda* S. & A.

For full bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-45, 1901.

EXHIBIT: Larva, pupa, adult, and figure.

**THE ISABELLA TIGER MOTH.***Isia isabella* S. & A.(Formerly *Pyrrharcia*.)

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 44-45, 1903.

EXHIBIT: Larva, cocoon, adult, and figure.

**THE VAGABOND CRAMBUS.***Crambus vulgivagellus* Clem.

For general accounts see Lintner, 1st Rpt. St. Ent. N. Y., pp. 127-151, 1882; Felt, Bul. 64, Cornell Univ. Agric. Expt. Sta., pp. 69-71, 1894.

EXHIBIT: Eggs, adult, work, figure, and parasite *Lampronotus frigida* Cr.**THE SPOTTED CUTWORM.***Noctua c-nigrum* Linn.

For general account and life history see Chittenden, Bul. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 54-58, 1901.

EXHIBIT: Pupa and adult.

**WHITE GRUB; MAY BEETLE.***Lachnosterna fusca* Fröh.

For account of white grubs see Forbes, 18th Rpt. St. Ent. Ill., pp. 109-145, 1894.

EXHIBIT: Adult.

**WHITE GRUB; JUNE BEETLE.***Lachnosterna arcuata* Smith.

For general account see Chittenden, Bul. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 74-76, 1901.

EXHIBIT: Adult and figure.

**THE DISTENDED MAY BEETLE.***Lachnosterna farcta* Lec.

For short notices see Comstock, Rpt. U. S. Dept. Agric. 1879, pp. 247-248, Pl. V, fig. 5, 1880, and Howard, Bul. 22, n. s., Div. Ent., U. S. Dept. Agric., p. 107, 1900.

EXHIBIT: Adult.

**THE BLUE-GRASS BILL-BUG.***Sphenophorus parvulus* Gyll.

For article see Forbes, 16th Rpt. St. Ent. Ill., pp. 63, 65, 1894.

EXHIBIT: Adult.

**THE LESSER LOCUST.***Melanoplus atlantis* Riley.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 178-183, pl. 12, fig. 7, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 26-27, 1891.

EXHIBIT: Adult.

**THE CAROLINA LOCUST.***Dissosteira carolina* Linn.

For short account see Forbes and Hart, Bul. 60, Ill. Agric. Expt. Sta., pp. 479-480, 1900.

EXHIBIT: Nymph and adult.

**THE TIMOTHY PLANT-BUG.***Oncognathus binotatus* Fab.

For general account see Howard, Insect Life, Vol. V, pp. 90-92, 1892.

EXHIBIT: Adult.

**THE GREATER WHEAT-STEM MAGGOT.***Meromyza americana* Fitch.

For general article see Webster, Bul. 42, Div. Ent., U. S. Dept. Agric., pp. 43-51, 1903.

EXHIBIT: Adult and figure.

**LEATHER JACKET; MEADOW WORM.***Tipula bicornis* Loew.

For general account see Forbes, 16th Rpt. St. Ent. Ill., pp. 78-83, 1890.

EXHIBIT: Adult and figure.

**INSECTS INJURIOUS TO ALFALFA.****THE VARIEGATED CUTWORM.***Peridroma saucia* Hbn.

For general bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp., 46-64, 1901.

EXHIBIT: Larva and adult.

**THE FALL ARMY WORM.***Laphygma frugiperda* S. & A.

For full bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-45, 1901.

EXHIBIT: Larva and adult.

**THE ALFALFA WEBWORM.***Loxostege commixtalis* Walk.

(Formerly *L. cerealis* Zell.)

For account of *Loxostege* sp. attacking alfalfa see Insect Life, Vol. VI, p. 36, 1893.

EXHIBIT: Adult.

**THE TWO-STRIPED LOCUST.***Melanoplus bivittatus* Say.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 363-368, pl. 24, fig. 5, 1897.

EXHIBIT: Adult and figure.

**THE DIFFERENTIAL LOCUST.***Melanoplus differentialis* Thos.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 349-354, pl. 23, figs. 3 and 4, 1897; also Morgan, Bul. 30, n. s., Div. Ent. U. S. Dept. Agric., pp. 7-26, 1901.

EXHIBIT: Adult and figure.

**THE ROCKY-MOUNTAIN LOCUST.***Melanoplus spretus* Thos.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 184-190, pl. 12, fig. 8, 1897.

EXHIBIT: Adult.

**THE AMERICAN LOCUST.***Schistocerca americana* Dru.

For life history and general account see Howard, Insect Life, Vol. VII, pp. 220-229, 1897; also Morgan, Bul. 30, n. s. Div. Ent., U. S. Dept. Agric., p. 27, 1901.

EXHIBIT: Adult.

**THE CLOVER-SEED CHALCIS-FLY.***Bruchophagus funebris* How.

For general account see Hopkins, Bul. 6, n. s., Div. Ent. U. S. Dept. Agric., p. 73, 1896, and Bul. 17, n. s., p. 45, 1898; Titus, Bul. 44, pp. 77-80, 1904.

EXHIBIT: Adult and work.

**INSECTS INJURIOUS TO CLOVER.**

For list of clover insects, and short articles on several important species, see Bruner and Hunter, Rpt. St. Bd. Agr. Nebr., pp. 240-285, 1898.

**INJURING THE ROOTS.****THE CLOVER ROOT-BORER.***Hylastinus trifolii* Müll.

(Formerly *Hylastes*.)

For general articles see Riley, Rpt. U. S. Dept. Agr., f. 1878, pp. 248-250, 1879.

EXHIBIT: Adult, work, figure, and enemy, *Telephorus bilineatus* Say.

**INJURING THE STEM.****THE CLOVER STEM-BORER.***Languria mozzardi* Latr.

For general account see Weed, Bul. Ohio Agr. Expt. Sta., 2d series, Vol. III, No. 8, p. 235, 1890.

EXHIBIT: Adult.

**INJURING THE LEAVES.****THE CLOVER MITE.***Bryobia pratensis* Garm.

For general article see Garman, 14th Rpt. St. Ent. Ill., p. 73, 1885; Bruner, Rpt. Nebr. St. Bd. Agric. f. 1898, pp. 280-284, 1899; Marlatt, Cir. 19, Div. Ent., U. S. Dept. Agric., 1897.

EXHIBIT: Figure.

**CLOVER ALEYRODES.***Aleyrodes* sp.

EXHIBIT: Adult and work.

**THE WHEAT THRIPS.***Thrips tritici* Fitch.

For citations to literature see Lintner, 11th Rpt. N. Y. St. Ent., pp. 247-250, 1896.

EXHIBIT: Figure.

**THE CLOVER-LEAF WEEVIL.***Phytonomus punctatus* Fab.

For general account see Lintner, 1st Rpt. St. Ent. N. Y., pp. 247-253, 1883; Sanderson, Insects injurious to staple crops, pp. 177-179, 1902.

EXHIBIT: Larva, cocoon, adult, work, figure, and enemy, *Collops 4-maculatus* Fab.



**THE GRAPE-VINE COLASPIS.***Colaspis brunnea* Fab.

For general article see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 13-14, 1903.

EXHIBIT: Adult.

**THE 12-SPOTTED CUCUMBER BEETLE.***Diabrotica duodecimpunctata* Ol.

For general account and remedies see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 12-13, 1903; Quaintance, Bul. 26, n. s., Div. Ent., U. S. Dept. Agric., pp. 35-40, 1900.

EXHIBIT: Adult, figure, and parasite, *Celatoria diabroticæ*.

**WESTERN CORN ROOT-WORM.***Diabrotica longicornis* Say.

For general account see Forbes, 12th Rpt. St. Ent. Ill., pp. 10-31, figs. 1-5, 1883.

EXHIBIT: Adult.

**THE IMBRICATED SNOUT-BEETLE.***Epicærus imbricatus* Say.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 28-29, 1903; Bul. 19, n. s., pp. 62-67, 1899.

EXHIBIT: Adult.

**THE GIBBOUS JUNE-BEETLE.***Lachnosterna gibbosa* Burm.

For general account of white grubs see Forbes, 18th Rpt. St. Ent. Ill., pp. 109-144, 1894.

EXHIBIT: Adult.

**THE FLAVESCENT CLOVER WEEVIL.***Sitones flavescens* Marsh.

For brief account see Osborn and Gossard, Bul. 14, Ia. Agric. Expt. Sta., pp. 177-178, 1891.

EXHIBIT: Adult.

**GRAPHORHINUS VADOSUS Say.**

For brief account see Webster, Amer. Nat., Vol. XVI, p. 746, 1882.

EXHIBIT: Adult.

**THE ASH-GRAY BLISTER BEETLE.***Macrobasis unicolor* Kby.

For general account see Chittenden, Yearbook, U. S. Dept. Agric., 1898, pp. 249-250.

EXHIBIT: Adult.

**FOUR-LINED PLANT-BUG.***Pæcilocapsus lineatus* Fab.

For general accounts see Lintner, 1st Rpt. St. Ent. N. Y., pp. 271-281, 1883; Slingerland, Bul. 58, Cornell Univ. Agr. Expt. Sta., pp. 207-239, 1893.

EXHIBIT: Adult.

**THE TARNISHED PLANT-BUG.***Lygus pratensis* Linn.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 312-315, 1885.

EXHIBIT: Adult.

**THE CLOVER-LEAF MIDGE.***Dasyneura trifolii* Loew.

(Formerly *Cecidomyia*.)

For brief articles see Bruner, Rpt. St. Bd. Agric. Nebr., 1898, pp. 250-251, 1899; Comstock, Rpt. U. S. Dept. Agric., 1879, pp. 197-199, 1880.

EXHIBIT: Cocoon, adult, and work.

**THE RED-BANDED LEAF-ROLLER.***Eulia triferana* Walk.(Formerly *Lophoderus*.)

For brief accounts see Lugger, 4th Rpt. State Ent. Minn., p. 231, 1899; Forbes, 14th Rpt. St. Ent. Ill., pp. 20-21, 1885.

EXHIBIT: Pupa and adult.

**THE RUSTY-BROWN TORTRIX.***Platynota flavedana* Clem.

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 231-232, 1899.

EXHIBIT: Eggs, pupa, and adult.

**THE SULPHUR-COLORED TORTRIX.***Epagoge sulfureana* Clem.(Formerly *Tortrix* and *Dichelia*.)

For brief account see Lugger, 4th Rpt. St. Ent. Minn., pp. 232-233, 1899. For bibliography see Forbes, 14th Rpt. St. Ent. Ill., pp. 17-20, 1885.

EXHIBIT: Pupa, adult, and work.

**CELOSTATHMA DISCOPUNCTANA** Clem.(Formerly *Amphisa*.)

For brief notice see Comstock, Rpt. U. S. Dept. Agric. f. 1880, p. 258, 1881.

EXHIBIT: Pupa and adult.

**THE FALL ARMY WORM.***Laphygma frugiperda* S. & A.

For full life history and bibliography see Chittenden, Bul. 29, n. s., Div. Ent. U. S. Dept. Agric., pp. 13-45, 1901.

EXHIBIT: Adult.

**ANAPHORA POPEANELLA** Clem.

For general account see Riley and Howard, Insect Life, Vol. III, pp. 27-28, 1890.

EXHIBIT: Adult.

**THE OBLIQUE-BANDED LEAF-ROLLER.***Archips rosaceana* Harr.(Formerly *Cacæcia*.)

For general account see Lugger, 4th Rpt. St. Ent. Minn., pp. 226-227, 1899.

EXHIBIT: Pupa and adult.

**THE GARDEN WEBWORM.***Loxostege similalis* Guen.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 39-40, 1903.

EXHIBIT: Adult and work.

**ARISTOTELIA ROSEOSUFFUSELLA** Clem.(Formerly *Gelechia*.)

For brief reference to food plant see Murtfeldt, Bul. 23, Div. Ent., U. S. Dept. Agric., p. 54, 1891.

EXHIBIT: Pupa and adult.

**ECTROPIS CREPUSCULARIA** D. and S.(Has been placed in genera *Cymatophora*, *Cleora*, and *Boarmia*.)

For brief accounts see Packard, 5th Rpt. U. S. Ent. Comm., p. 371, 1890; Lugger, 4th Rpt. St. Ent. Minn., p. 188, 1899.

EXHIBIT: Adult.

**DRASTERIA ERECHTEA** Cram.

For general account see Slingerland, Insect Life, Vol. V, pp. 87-88, 1892.

EXHIBIT: Larva, cocoon, pupa, and adult.

**THE CHICKWEED GEOMETER.***Hæmatopsis grataria* Fab.

For brief notice see Forbes, 14th Rpt. St. Ent. Ill., p. 74, 1885.

EXHIBIT: Adult.

**IO MOTH.***Automeris io* Fab.

For general account see Lugger, 4th Rpt. State Ent. Minn., pp. 126-129, fig. 130, and pl. 16, fig. 129, 1899.

EXHIBIT: Larva, cocoon, and adult.

**CATOPYRRHA DISSIMILARIA** Hbn.(Formerly *Aspilates*.)

EXHIBIT: Adult.

**THE GREEN CLOVER WORM.***Plathypena scabra* Fab.(Formerly *Hypena*.)

For accounts see Comstock, Rpt. U. S. Dept. Agric. f. 1879, p. 252, 1880; Chittenden, Bul. 30, n. s., Div. Ent., U. S. Dept. Agric., pp. 44-50, 1901.

EXHIBIT: Larva, pupa, and adult.

**THE SMALL WHITE BRISTLY CUTWORM.***Mamestra renigera* Steph.

For short account see Forbes, 16th Rpt. St. Ent. Ill., pp. 95-96, 1890.

EXHIBIT: Larva, pupa, and adult.

**THE CLOVER CUTWORM.***Mamestra trifolii* Rott.

For account see Riley, Rpt. U. S. Dept. Agric. 1883, pp. 123-124, 1883.

EXHIBIT: Larva and adult.

**ARMY WORM.***Heliophila unipuncta* Harv.(Formerly *Leucania*.)

For bibliography and life history see Lintner, 12th Rpt. N. Y. St. Ent., pp. 190-214, 1896.

EXHIBIT: Larva, pupa, and adult.

**THE VARIEGATED CUTWORM.***Peridroma saucia* Hübn.

For general bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 46-64, 1902.

EXHIBIT: Larva, adult, and figure.

**THE COMMELINA OWLET MOTH.***Prodenia commelinæ* S. & A.

For life history and general account see Chittenden, Bul. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 59-64, Pl. IV, fig. 1, 1901.

EXHIBIT: Larva, pupa, and adult.

**THE DARK-SIDED CUTWORM.***Euxoa messoria* Harr.(Formerly *Carneades*.)

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 290-291, 1885.

EXHIBIT: Larva and adult.

**THE SMEARED DAGGER.***Apatela obliquata* S. & A.(Formerly *Acronycta*.)

For general account see Packard, 5th Rpt. U. S. Ent. Comm., pp. 567-568, 1890.

EXHIBIT: Larva, cocoon, and adult.

**THE BRONZED CUTWORM.***Nephelodes minians* Guen.

For life history and partial bibliography see Lintner, 1st Rpt. St. Ent. N. Y., pp. 99-110, 1882; Riley, Rpt. U. S. Dept. Agric. f. 1890, pp. 244-246, 1891.  
 EXHIBIT: Larva and adult.

**THE CABBAGE LOOPER.***Autographa brassicæ* Riley.

(Formerly *Plusia*.)  
 For general account and life history see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 60-69, 1902.  
 EXHIBIT: Larva, adult, and figure.

**THE NAIS TIGER-MOTH.***Apantesis nais* Dru.

(Formerly *Arctia*.)  
 For account see Beutenmuller, "Cat. Lepid. N. Y.," Ann. Acad. N. Y., p. 206, 1890.  
 EXHIBIT: Adult.

**ZEBRA CATERPILLAR.***Mamestra picta* Harr.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 42-43, 1903.  
 EXHIBIT: Larva and adult.

**THE ISABELLA TIGER-MOTH.***Isia isabella* S. & A.

(Formerly *Pyrrharctia*.)  
 For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 44-45, 1903.  
 EXHIBIT: Larva and adult.

**THE NORTHERN CLOUDY-WING.***Thorybes pylades* Scud.

(Formerly *Eudamus*.)  
 EXHIBIT: Adult.

**THE COMYNTAS BUTTERFLY.***Everes comyntas* Godt.

(Formerly *Lycæna*.)  
 For brief account see Lintner, 4th Rpt. N. Y. St. Ent., p. 137, 1888.  
 EXHIBIT: Adult.

**THE AMERICAN COPPER.***Heodes hypophlæas* Bd.

(Formerly *Chrysophanus*.)  
 EXHIBIT: Adult.

**LEMONIAS EDITHA** Bd.

(Formerly *Melitæa*.)  
 EXHIBIT: Figure.

**SOUTHERN DOG-FACE BUTTERFLY.***Zerene cæsonia* Stall.

(Formerly *Colias*.)  
 For brief notice see Thomas, 10th Rpt. St. Ent. Ill., p. 78, 1881; Howard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., p. 84, 1897.  
 EXHIBIT: Adult.

**THE ORANGE SULPHUR.***Eurymus eurytheme* Bd.

(Formerly *Colias*.)  
 For brief account see French, 7th Rpt. St. Ent. Ill., pp. 147-148, 1878.  
 EXHIBIT: Larva and adult.

**THE YELLOW BUTTERFLY.***Eurymus philodice* Godt.(Formerly *Colias*.)

For brief account see Davis, Bul. 116, Mich. Agr. Expt. Sta., p. 61, 1894.

EXHIBIT: Adult.

**THE CLOUDLESS SULPHUR.***Callidryas eubule* Linn.

For brief account see French, 7th Rpt. St. Ent. Ill., pp. 147-148, 1878.

EXHIBIT: Larva, pupa, and adult.

**THE BLACK-BORDERED YELLOW.***Eurema nicippe* Cram.(Formerly *Terias*.)

For brief account see French, 7th Rpt. St. Ent. Ill., p. 148, 1878.

EXHIBIT: Larva, pupa, and adult.

**THE LITTLE SULPHUR.***Eurema euterpe* Men.(Formerly *Terias lisa*.)

For brief account see French, 7th Rpt. St. Ent. Ill., p. 148, 1878.

EXHIBIT: Adult.

**OLETHREUTES INSTRUTANA** Clem.

EXHIBIT: Adult.

**THE CLOVER-HAY WORM.***Hypsopygia costalis* Fab.(Formerly *Asopia* and *Pyrallis*.)

For bibliography and general account see Lintner, 11th Rpt. St. Ent. N. Y., pp. 145-151, 1896.

EXHIBIT: Larva and adult.

**THE MEAL SNOUT-MOTH.***Pyrallis farinalis* Linn.

For short account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 10-11, 1897.

EXHIBIT: Larva, pupa, cocoon, and adult.

**THE CLOVER APHIS.***Macrosiphum trifolii* Perg.

(Attacks dandelion, oats, red clover, strawberry, wheat, etc.)

For general account see Pergande, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 21-23, 1904.

EXHIBIT: Figure.

**THE TWO-STRIPED LOCUST.***Melanoplus bivittatus* Say.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 363-368, pl. 24, fig. 5, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 31-32, 1891.

EXHIBIT: Adult and figure.

**THE LESSER LOCUST.***Melanoplus atlantis* Riley.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 178-183, pl. 12, fig. 7, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 26-27, 1891.

EXHIBIT: Adult.

**THE DIFFERENTIAL LOCUST.***Melanoplus differentialis* Thos.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 349-354, pl. 23, figs. 3 and 4; Morgan, Bul. 30, n. s., Div. Ent., U. S. Dept. Agric., pp. 7-26, 1901.

EXHIBIT: Adult.

**RED-LEGGED LOCUST.***Melanoplus femur-rubrum* DeG.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 278-285; pl. 1, fig. h; pl. 19, figs. 1-4, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 27-28, 1891.

EXHIBIT: Adult.

**THE ROCKY-MOUNTAIN LOCUST.***Melanoplus spretus* Thos.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 184-190, pl. 12, fig. 8, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 9-26, 1891.

EXHIBIT: Adult.

**INJURING THE FLOWERS AND SEEDS.****THE CLOVER-FLOWER MIDGE.***Dasyneura leguminicola* Lint

(Formerly *Cecidomyia*.)

For general account see Riley, Rpt. U. S. Dept. Agric., 1878, pp. 250-252, 1879.

EXHIBIT: Cocoon, adult, and figure.

**THE CLOVER-SEED CHALCIS-FLY.***Bruchophagus funebris* How.

For brief accounts see Hopkins, Bul. 6, n. s., Div. Ent., U. S. Dept. Agric., p. 73, 1896, and Bul. 17, n. s., p. 45, 1898; Titus, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 77-80, 1904.

EXHIBIT: Adult and work.

**THE CLOVER-SEED WORM.***Enarmonia interstinctana* Clem.

(Formerly *Grapholitha*.)

For bibliography and general account see Lintner, 11th Rept. St. Ent. N. Y., pp. 152-157, 1896.

EXHIBIT: Pupa, adult, and work.

**INSECTS INJURIOUS TO SMALL GRAINS.**

For general articles see Howard, Tech. Ser. 2, Div. Ent., U. S. Dept. Agric., 24 pp., 1896; Marlatt, Farmers' Bul. 132, U. S. Dept. Agric., 38 pp., 1901; Webster, Bul. 42, Div. Ent., U. S. Dept. Agric., 62 pp., 1903.

**THE LESSER LOCUST.***Melanoplus atlantis* Riley.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 178-183, pl. 12, fig. 7, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 26-27, 1891.

EXHIBIT: Nymph and adult.

**THE RED-LEGGED LOCUST.***Melanoplus femur-rubrum* DeG.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 278-285, pl. 1, fig. h; pl. 19, figs. 1-4, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 27-28, 1891.

EXHIBIT: Nymph and adult.

**THE ROCKY MOUNTAIN LOCUST.***Melanoplus spretus* Thos.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 184-190, pl. 12, fig. 8, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 9-26, 1891.

EXHIBIT: Nymph, adult, and figure.

**THE WESTERN CRICKET.***Anabrus purpurascens* Uhl.

For detailed account see Packard, 2d Rpt. U. S. Ent. Comm., pp. 163-178, 1879.

EXHIBIT: Adult.

**THE CLEAR-WINGED LOCUST.***Camnula atrox* Scuddl.

For account of an allied species (*C. pellucida*) see Simpson, Circ. 53, Div. Ent., U. S. Dept. Agric., 1903.

EXHIBIT: Adult.

**THE ARMY WORM.***Heliophila unipuncta* Harv.

(Formerly *Leucania*.)

For bibliography and life history see Lintner, 12th Rept. St. Ent. N. Y., pp. 190-214, 1896.

EXHIBIT: Larva, pupa, adult, and figure.

**FALL ARMY WORM.***Laphygma frugiperda* S. & A.

For full bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-45, 1901.

EXHIBIT: Larva, pupa, and adult.

**STALK BORER.***Papaipema nitela* Guen.

(Bores in stems of various plants.)

For general account see Bird, Can. Ent., Vol. XXX, pp. 127-128, 1898.

EXHIBIT: Larva, pupa, adult, and work.

**WHEAT-HEAD ARMY WORM.***Heliophila albilinea* Hbn.

For general account see Riley, 9th Rept. St. Ent. Mo., pp. 50-57, 1877.

EXHIBIT: Pupa, adult, figure, and parasites: *Anomalon apicale* Cress., *Tachina anonyina* Riley.

**NUTTALL'S BLISTER BEETLE.***Cantharis nuttalli* Say.

For short article see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 27, 1903.

EXHIBIT: Adult.

**THE CLAY-COLORED BILL-BUG.***Sphenophorus equalis* Lec.

(Treated as *S. ochreus* Lec. by authors.)

For articles on bill-bugs see Forbes, 16th Rept. St. Ent. Ill., pp. 58-74, 1890; Webster, Insect Life, Vol. II, pp. 132-134, 1889.

EXHIBIT: Adult.

**THE GERMAN GRAIN-APHIS.***Macrosiphum cerealis* Kalt.

(Attacks barley, chess, meadow, orchard, and velvet grass, oats, rye, and wheat, feeding on ears, racemes, and other parts of plant.)

For general account see Pergande, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 18-21, 1904.

EXHIBIT: Figure.

### THE ENGLISH GRAIN-APHIS.

*Macrosiphum granaria* Buck.

(Formerly *Nectarophora* and *Aphis*. Attacks green foxtail, meadow, and orchard grass, oats, red-clover, red top, rye, wheat, and wild rye.)

For general account see Pergande, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 13-18, 1904.

EXHIBIT: Figure and work; parasite, *Lysiphlebus testaceipes* Cress. (figure); and enemies, *Anatis 15-punctata* Ol.; *Coccinella sanguinea* Linn.; *Hippodamia parenthesis* Say; *Podabrus tomentosus* Say; *Spharophoria cylindrica* Say; *Syrphus americanus* Wied.

### THE EUROPEAN GRAIN-APHIS.

*Siphocoryne avenæ* Fab.

(Formerly *Nectarophora* and *Aphis*. Attacks apple, burdock, celery, choke-cherry, dogwood, grasses, oats, rye, wheat, and other plants.)

For general account see Pergande, Bul. 44, Div. Ent., U. S. Dept. Agric., pp. 5-13, 1904.

EXHIBIT: Figure.

### THE CHINCH BUG.

*Blissus leucopterus* Say.

(Injures cane, corn, oats, rye, wheat, etc.)

For bibliography, 1785-1888, see Forbes, App. to 16th Rept. St. Ent. Ill., pp. 1-102. 1894. For general articles see Forbes, 16th Rept. St. Ent. Ill., pp. 1-57, 1894; Webster, Bul. 15, n. s., Div. Ent., U. S. Dept. Agric., 82 pp., 1898.

EXHIBIT: Eggs, nymph, adult, and figure.

### THE GRAIN LEAF-HOPPER.

*Dierodrocephalus flaviceps* Riley.

For account of *D. mollipes* see Osborn & Ball, Bul. 34, Iowa Agric. Expt. Sta., p. 614, 1897.

EXHIBIT: Adult.

### THE DESTRUCTIVE LEAF-HOPPER.

*Cicadula exitiosa* Uhl.

For general account see Comstock, Rpt. U. S. Comm. Agric., 1879, pp. 191-193, 1880.

EXHIBIT: Adult.

### THE WHEAT SAWFLY.

*Dolerus arvensis* Say.

For general account see Riley and Marlatt, Insect Life, Vol. IV, pp. 171-172, 1891.

EXHIBIT: Adult and figure.

### THE GRASS SAWFLY.

*Pachynematus extensicornis* Nort.

(Formerly *Nematus marylandicus*.)

For article under *N. marylandicus* see Riley and Marlatt, Insect Life, Vol. IV, pp. 174-177, 1891.

EXHIBIT: Adult and figure.

### THE WESTERN GRAIN SAWFLY.

*Xephus occidentalis* Marl.

For short article see Riley and Howard, Insect Life, Vol. II, p. 286, 1890.

EXHIBIT: Adult, work, and figure.



**JOINT-WORMS.**

For special articles to four following species see Howard, Tech. Ser. 2, Div. Ent., U. S. Dept. Agric., 24 pp., 1896; also Webster, Bul. 42, Div. Ent., U. S. Dept. Agric., 62 pp., 1903.

**GREATER WHEAT-STRAW WORM.**

*Isosoma grande* Riley.

EXHIBIT: Adult and figure.

**BARLEY-STRAW WORM.**

*Isosoma hordei* Harr.

EXHIBIT: Adult, work, and figure.

**THE WHEAT JOINT-WORM.**

*Isosoma tritici* Riley.

EXHIBIT: Adult, work, and figure.

**THE HAIRY-FACED JOINT-WORM.**

*Isosoma hirtifrons* How.

EXHIBIT: Adult and figure.

**THE HESSIAN FLY.**

*Mayetiola destructor* Say.

(Formerly *Cecidomyia*.)

For general article with bibliography see Osborn, Bul. 16, n. s., Div. Ent., U. S. Dept. Agric., 57 pp., 1898; Marlatt, Farmers' Bul. 132, U. S. Dept. Agric., pp. 13-22, 1901.

EXHIBIT: Puparia, adult, work, figures, and map.

**THE GREATER WHEAT-STEM MAGGOT.**

*Meromyza americana* Fitch.

For general article see Webster, Bul. 42, Div. Ent., U. S. Dept. Agric., pp. 43-51, 1903.

EXHIBIT: Adult, work, and figure.

**THE AMERICAN FRIT-FLY.**

*Oscinis soror* Macq.

For general article see Webster, Bul. 42, Div. Ent., U. S. Dept. Agric., pp. 57-62, 1903.

EXHIBIT: Adult, work, and figure.

**THE LESSER WHEAT-STRAW MAGGOT.**

*Oscinis carbonaria* Loew.

For general article see Webster, Bul. 42, Div. Ent., U. S. Dept. Agric., pp. 51-56, 1903.

EXHIBIT: Adult.

**CHLOROPS PROXIMA Say.**

For short account see Comstock, Rpt. U. S. Comm. Agric., 1879, pp. 257-258, 1880.

EXHIBIT: Adult and work.

**INSECTS INJURIOUS TO HOPS.****THE HOP APHIS.**

*Phorodon humuli* Schr.

(Attacks hop and plum.)

For full life history see Riley, Cir. 2, Div. Ent., U. S. Dept. Agric., 1891.

EXHIBIT: Adult, work, and figures, with two enemies: *Chrysopa* sp. and *Adalia bipunctata* Linn.

**THE COMMA BUTTERFLY.***Polygonia comma* Harr.(Formerly *Grapta*.)

For general account see Howard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 50-51, 1897.

EXHIBIT: Larva and adult.

**THE SEMICOLON BUTTERFLY.***Polygonia interrogationis* Fab.

For general account see Howard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 47-49, 1897.

EXHIBIT: Larva and adult.

**THE HOP GRUB.***Gortyna inmanis* Guen.

For general account and life history see Howard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-44, 1897.

EXHIBIT: Pupa, adult, and work.

**THE HOP SNOOT-MOTH.***Hypona humuli* Harr.

For general account see Howard, Bul. 7, n. s., Div. Ent., U. S. Dept. Agric., pp. 44-47, 1897.

EXHIBIT: Larva, pupa, and adult.

**THE VARIEGATED CUTWORM.***Peridroma saucia* Hbn.

For general bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 46-64, 1901.

EXHIBIT: Larva and adult.

**THE MEXICAN COTTON BOLL WEEVIL.****MEXICAN COTTON BOLL WEEVIL.***Anthonomus grandis* Boh.

(Breeds in and destroys bolls.)

For full life history and general account see Hunter and Hinds, Bul. 51, Bur. Ent., U. S. Dept. Agric., 1905; also Hunter, Farmers' Bul. 216, U. S. Dept. Agric., 1905.

EXHIBIT: Life history (larvæ, pupæ, adults, injured cotton bolls, with stages present in bolls, and uninjured bolls); illustrations and map showing distribution in United States.

**THE COTTON BOLLWORM; CORN-EAR WORM.****COTTON BOLLWORM; CORN-EAR WORM.***Heliothis obsoleta* Fab.(Formerly *H. armiger*. *H. obscura* by error. Larvæ feed on bolls of cotton, ears of corn, tobacco buds, beans, and in tomatoes; also cut off young plants of various garden crops.)

For full life history and general account see Quaintance and Brues, Bul. 50, Bur. Ent., U. S. Dept. Agric., 1905; also Quaintance and Bishopp, Farmers' Bul. 212, U. S. Dept. Agric., 1905.

EXHIBIT: Larva, pupa, adult, work in cotton bolls, and illustrations of different stages, and work on various plants. Parasite exhibited: *Archytas piliventris* v. d. W.; adult, pupa, and figure. Enemies exhibited: *Calosoma lugubre* Lec., *C. sayi* Dej., *C. scrutator* Fab., *Polistes annularis* Linn., and *P. rubiginosus* Lep.

## INSECTS INJURIOUS TO SUGAR BEET.

For general articles see Forbes and Hart, Bul. 60, Ill. Agr. Expt. Sta., 136 pp., 1900; Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., 71 pp., 1903.

### RED-LEGGED LOCUST.

*Melanoplus femur-rubrum* DeG.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 278-285, pl. 1, fig. h. pl. 19, figs. 1-4, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 27-28, 1891.

EXHIBIT: Adult and figure.

### THE DIFFERENTIAL LOCUST.

*Melanoplus differentialis* Thos.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 349-354, pl. 23, figs. 3 and 4, 1897; also Morgan, Bul. 30, n. s., Div. Ent., U. S. Dept. Agric., pp. 7-26, 1901.

EXHIBIT: Adult and figure.

### THE ROCKY-MOUNTAIN LOCUST.

*Melanoplus spretus* Thos.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 184-190, pl. 12, fig. 8, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 9-26, 1891.

EXHIBIT: Adult.

### THE TWO STRIPED LOCUST.

*Melanoplus bivittatus* Say.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 363-368, pl. 24, fig. 5, 1897.

EXHIBIT: Adult, nymph, and figure.

### THE LESSER LOCUST.

*Melanoplus atlantis* Riley.

For bibliography and general account see Scudder, Proc. U. S. N. M., Vol. XX, pp. 178-183, pl. 12, fig. 7, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 26-27, 1891.

EXHIBIT: Adult.

### THE CAROLINA LOCUST.

*Dissosteira carolina* Linn.

For short account see Forbes and Hart, Bul. 60, Ill. Agr. Expt. Sta., pp. 479-480, 1900.

EXHIBIT: Nymph, adult, and parasite *Frontina frenchii* Will.

### THE BEET LEAF-MINER.

*Pegomya vicina*, Lint.

EXHIBIT: Adult and figure.

### THE BEET CHLOROPS.

*Chlorops assimilis* Macq.

EXHIBIT: Puparium and adult.

### THE COMMON ARMY WORM.

*Heliothrips unipuncta* Harr.

(Formerly *Leucania*.)

For bibliography and life history see Lintner, 12th Rept. St. Ent. N. Y., pp. 190-214, 1896.

EXHIBIT: Larva and adult.

**THE VARIEGATED CUTWORM.***Peridroma saucia* Hübn.

For general bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 46-64, 1902.

EXHIBIT: Larva, adult, and figure.

**THE PURSLANE CATERPILLAR.***Copidryas gloveri* G. & R.

EXHIBIT: Larva and adult.

**FALL ARMY WORM.***Laphygma frugiperda* S. & A.

For full bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-45, 1901.

EXHIBIT: Larva, adult, and figure.

**THE WHITE-LINED SPHINX.***Deilephila lineata* Fab.

EXHIBIT: Adult and figure.

**THE BEET ARMY WORM.***Caradrina exigua* Hbn.

For general articles see Gillette, 12th Rpt. Colo. Agr. Expt. Sta., p. 39, 1900; Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 37-46, 1902.

EXHIBIT: Adult and figure.

**THE ZEBRA CATERPILLAR.***Mamestra picta* Harr.

For bibliography and general life history see Felt, 14th Rpt. N. Y. St. Ent., pp. 201-207, 1898.

EXHIBIT: Larva and adult.

**GARDEN WEBWORM.***Loxostege similalis* Guen.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 39-40, 1903.

EXHIBIT: Cocoon, adult, and figure.

**THE SUGAR-BEET WEBWORM.***Loxostege sticticalis* Linn.

For general account see Forbes, Bul. 60, Ill. Agr. Expt. Sta., p. 457-459, 1900.

EXHIBIT: Cocoon, pupa, adult, and figure.

**THE ISABELLA TIGER MOTH.***Isia isabella* S. & A.

(Formerly *Pyrrharctia*.)

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 44-45, 1903.

EXHIBIT: Larva, adult, and figure.

**THE CLOVER CUTWORM.***Mamestra trifolii* Rott.

For account see Riley, Rpt. U. S. Dept. Agric., 1883, pp. 123-124, 1883.

EXHIBIT: Larva, adult, and parasites *Ophion purgatum* Say and *Euphorocera claripennis* Macq.

**THE CABBAGE LOOPER.***Autographa brassicae* Riley.

For general account and life history see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 60-69, 1902.

EXHIBIT: Larva, adult, and parasite *Limneria tibiator* Cr.

**THE GARDEN FLEA-HOPPER.***Halticus uhleri* Giard.

For general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 57-62, 1899.

EXHIBIT: Adult and figure.

**THE TARNISHED PLANT-BUG.***Lygus pratensis* Linn.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 312-315, 1885.

EXHIBIT: Adult and figure.

**THE SANDY GROUND BUG.***Emblethis arenarius* Linn.

EXHIBIT: Adult.

**PURSLANE BUG.***Geocoris bullatus* Say.

EXHIBIT: Adult.

**THE MILITARY BUG.***Hadronema militaris* Uhl.

EXHIBIT: Adult.

**CLOUDED PIGWEED BUG.***Sphragisticus nebulosus* Fall.

EXHIBIT: Adult.

**THE BROWN LEAF-HOPPER.***Agallia sanguinolenta* Prov.

EXHIBIT: Adult.

**THE CHINCH-BUG.***Blissus leucopterus* Say.

For general article and life history see Webster, Bul. 15, n. s., Div. Ent., U. S. Dept. Agric., 82 pp. 1898.

EXHIBIT: Eggs, nymph, adult, and figure.

**THE FALSE CHINCH-BUG.***Nysius angustatus* Uhl.

(Attacks many garden crops.)

EXHIBIT: Adult and figure.

**HOODED PLANT-BUG.***Euthoecta galeator* Fab.

EXHIBIT: Eggs, nymph, and adult.

**THE IMBRICATED SNOUT-BEETLE.***Epicærus imbricatus* Say.

For detailed account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 62-67, 1899.

EXHIBIT: Adult and figure.

**THE GIBBOUS JUNE BEETLE.***Lachnosterna gibbosa* Burm.

For general account of white grubs see Forbes, 18th Rpt. St. Ent. Ill., pp. 109-144, 1894.

EXHIBIT: Adult and figure.

**THE 12-SPOTTED CUCUMBER BEETLE.***Diabrotica duodecimpunctata* Ol.

For general account and remedies see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 12-13, 1903; Quaintance, Bul. 26, n. s., pp. 35-40, 1900.

EXHIBIT: Adult, figures, and parasite *Celatoria diabroticæ*.

**MONOCREPIDIUS VESPERTINUS** Fab.

EXHIBIT: Adult and figure.

**PENCILED SNOUT-BEETLE.***Centrinus penicellus* Hbst.

EXHIBIT: Adult.

**THE GREATER SUGAR-BEET LEAF-BEETLE.***Monoxia puncticollis* Say.

EXHIBIT: Adult and figure.

**THE LESSER SUGAR-BEET LEAF-BEETLE.***Monoxia consputa* Lec.

EXHIBIT: Adult and figure.

**THE GRAPE-VINE COLASPIS.***Colaspis brunnea* Fab.

For general article see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 13-14, 1903.

EXHIBIT: Adult and figure.

**WHITE GRUB; MAY BEETLE.***Lachnosterna fusca* Fröh.

For account of white grubs injuring corn see Forbes, 18th Rpt. St. Ent. Ill., pp. 109-145, 1894.

EXHIBIT: Adult and figure.

**THE CONVEX FLEA-BEETLE.***Psylliodes convexior* Lec.

EXHIBIT: Adult.

**THE PALE-STRIPED FLEA-BEETLE.***Systema blanda* Mels.

For general articles see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 22-29, 1900; Bul. 43, Div. Ent., p. 16, 1903.

EXHIBIT: Adult and figure.

**THE SPINACH FLEA-BEETLE.***Disonycha xanthomelæna* Dalm.

EXHIBIT: Adult, figure, and parasite *Hypostena barbata* Coq.

**THE WAVY-NECKED FLEA-BEETLE.***Disonycha crenicollis* Say.

EXHIBIT: Adult.

**THE TRIANGULAR FLEA-BEETLE.***Disonycha triangularis* Say.

EXHIBIT: Adult.

**THE CUCUMBER FLEA-BEETLE.***Epitrix cucumeris* Harr.

For short account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 89-90, 1899.

EXHIBIT: Adult and figure.

**THE TOOTHED FLEA-BEETLE.***Chaetocnema denticulata* Illig.

EXHIBIT: Adult.

**THE ASH-GRAY BLISTER BEETLE.***Macrobasis unicolor* Kby.

For short article see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 249-250, 1899.

EXHIBIT: Adult.

**THE SPOTTED BLISTER BEETLE.***Epicauta maculata* Say.

For general account see Saunders, Bul. 57, S. Dak. Agric. Expt. Sta., p. 52, 1898; Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 24-25, 1903.

EXHIBIT: Adult and figure.

**THE GRAY BLISTER BEETLE.***Epicauta cinerea* Först.

For brief account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 25, 1903.

EXHIBIT: Adult and figure.

**BLACK BLISTER BEETLE.***Epicauta pennsylvanica* DeG.

For brief account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 25, 1903.

EXHIBIT: Adult and figure.

**THE STRIPED BLISTER BEETLE.***Epicauta vittata* Fab.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 22-23, 1903.

EXHIBIT: Adult and figure.

**NUTTALL'S BLISTER BEETLE.***Cantharis nuttalli* Say.

For short article see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 27, 1903.

EXHIBIT: Adult and figure.

**INSECTS INJURIOUS TO BEANS AND PEAS.****THE LIMA-BEAN STEM-BORER.***Monoptilota nubilella* Hulst.

(Bores in stalks of Lima beans.)

For life history and general account see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 9-17, 1900.

EXHIBIT: Larva, cocoon, adult, work, and figure.

**SMALLER CORN STALK-BORER.***Elasmopalpus lignosellus* Zell.

For life history and general account see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 17-22, 1900.

EXHIBIT: Larva, adult, and figure.

**NUTTALL'S BLISTER BEETLE.***Cantharis nuttalli* Say.

For short article see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 27, 1903.

EXHIBIT: Adult and figure.

**THE ASH-GRAY BLISTER BEETLE.***Macrobasis unicolor* Kby.

For short article see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 249-250, 1899.

EXHIBIT: Adult.

**THE BEAN LEAF-BEETLE.***Cerotoma trifurcata* Först.

(Formerly *C. caminea* Fab.)

For general account see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 253-254, 1899.

EXHIBIT: Adult and figure.

**THE BEAN LADYBIRD.***Epilachna corrupta* Muls.

For general account see Gillette, Bul. 47, Colorado Agr. Expt. Sta., pp. 41-43, 1898; Chittenden, Yearbook, U. S. Dept. Agric., f. 1898, pp. 251-253, 1899.

EXHIBIT: Adult and figure.

**THE 12-SPOTTED CUCUMBER BEETLE.***Diabrotica duodecimpunctata* Ol.

For general accounts and remedies see Quaintance, Bul. 26, n. s., Div. Ent., U. S. Dept. Agric., pp. 35-40, 1900; Chittenden, Bul. 43, pp. 12-13, 1903.

EXHIBIT: Adult.

**THE IMBRICATED SNOUT-BEETLE.***Epicærus imbricatus* Say.

For detailed account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 62-67, 1899; for general account, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 28-29, 1903.

EXHIBIT: Adult.

**THE BANDED FLEA-BEETLE.***Systema tæniata* Say.

For short account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 17, 1903.

EXHIBIT: Adult.

**THE PALE-STRIPED FLEA-BEETLE.***Systema blanda* Mels.

For general article see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 22-29, 1900; Bul. 43, p. 16, 1903.

EXHIBIT: Adult and figure.

**THE LEAF-MINING LOCUST BEETLE.***Odontota dorsalis* Thunb.

(Lives on locust, but attacks beans and other leguminous plants.)

For full life history, bibliography, and distribution see Chittenden, Bul. 38, Div. Ent., U. S. Dept. Agric., pp. 70-73, 1902.

EXHIBIT: Adult and figure.



**THE DISTENDED MAY BEETLE.***Lachnosterna farcta* Lec.

For short notices see Comstock, Rpt. U. S. Dept. Agric. f. 1879, pp. 247-248, Pl. V, fig. 5, 1880; Howard, Bul. 22, n. s., Div. Ent., U. S. Dept. Agric., p. 107, 1900.

EXHIBIT: Adult.

**THE GARDEN FLEA-HOPPER.***Halticus uhleri* Giard.

For general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 57-62, 1899.

EXHIBIT: Adult and figure.

**THE DINGY CUTWORM.***Feltia subgothica* Haw.

For brief account see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, p. 257, 1899.

EXHIBIT: Adult.

**SALT-MARSH CATERPILLAR.***Estigmene acrea* Dru.

(Formerly *Leucarectia*.)

For short account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 43-44, fig. 41, 1903.

EXHIBIT: Adult.

**YELLOW-BEAR CATERPILLAR.***Diacrisia virginica* Fab.

(Formerly *Spilosoma*.)

For general account see Lugg, 4th Rpt. State Ent. Minn., pp. 79-81, fig. 78, 1899.

EXHIBIT: Adult and figure.

**THE BEAN CUTWORM.***Ogdoconta cinereola* Guen.

(Feeds on buds and leaves.)

For life history and general account see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 98-100, 1902.

EXHIBIT: Adult and figure.

**THE ROLLER WORM.***Eudamus proteus* Linn.

(Feeds on buds and leaves.)

For general article and life history see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 92-96, 1902.

EXHIBIT: Larva, chrysalis, adult, and figure.

**COMMON BEAN WEEVIL.***Bruchus obtectus* Say.

For general account and life history see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 239-242, 1899.

EXHIBIT: Adult, work, and figure.

**THE PEA WEEVIL.***Bruchus pisorum* Linn.

For general account and life history see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 234-239, 1899.

EXHIBIT: Adult, work, and figure.

**THE COWPEA WEEVIL.***Bruchus chinensis* Linn.

For general account and life history see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 242-245, 1899.

EXHIBIT: Adult and figure.

**FOUR-SPOTTED BEAN-WEEVIL.***Bruchus quadrimaculatus* Boh.

For general account and life history see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 245-247, 1899.

EXHIBIT: Adult and figure.

**THE LENTIL WEEVIL.***Bruchus lentis* Boh.

For brief account see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, p. 248, 1899.

EXHIBIT: Adult.

**EUROPEAN BEAN-WEEVIL.***Bruchus rufimanus* Boh.

For general account see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 247-248, 1899.

EXHIBIT: Adult.

**THE MEXICAN BEAN-WEEVIL.***Spermophagus pectoralis* Shp.

For brief account see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, p. 248, 1899.

EXHIBIT: Adult and figure.

**THE GRAY HAIR-STREAK.***Uranotes melinus* Hbn.

(Works in pods of peas and beans, and in silk corn. Formerly *Thecla*.)

For brief article see Chittenden, Bul. 33. n. s., Div. Ent., U. S. Dept. Agric., pp. 101-102, 1902.

EXHIBIT: Larva, pupa, adult, and figure.

**BOLLWORM; CORN-EAR WORM.***Heliothis obsoleta* Fab.

(See special case for full life history with illustrations.)

For life history and general account see Quaintance and Brues, Bul. 50, Bur. Ent., U. S. Dept. Agric., 1905; also Quaintance and Bishopp, Farmers' Bul. 212, U. S. Dept. Agric., 1905.

EXHIBIT: Larva, adult, work, and figure.

**THE IMPORTED PEA-MOTH.***Semasia nigricana* Steph.

For general accounts and life history see Fletcher, Rpt. Ent. and Bot., Can. Dept. Agric., 1900, p. 214, 1901; Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 96-98, 1902.

EXHIBIT: Adult and figure.

**INSECTS INJURIOUS TO CRUCIFERS.****IMPORTED CABBAGE-WORM.***Pontia rapæ* Sch.

(Formerly *Pieris*.)

For general accounts see Riley, Rpt. U. S. Dept. Agric. f. 1883, pp. 108-113, 1884; Lugger, 1st Rpt. St. Ent. Minn., pp. 71-77, Pl. VI, 1896; Chittenden, Cir. 60, Bur. Ent., U. S. Dept. Agric., 1905.

EXHIBIT: Larva, chrysalis, and adult.

**THE LARGE CABBAGE BUTTERFLY.***Pontia monuste* Linn.(Formerly *Pieris*.)

For general article see Riley, Rpt. U. S. Dept. Agric. f. 1883, pp. 117-118, 1884.

EXHIBIT: Adult.

**THE POT-HERB BUTTERFLY.***Pontia oleracea* Boisd.(Formerly *Pieris*.)

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1883, pp. 115-117, 1884.

EXHIBIT: Chrysalis and adult.

**THE SOUTHERN CABBAGE WORM.***Pontia protodice* Boisd.(Formerly *Pieris*.)For general articles see Riley, Rpt. U. S. Dept. Agric. f. 1883, pp. 114-115, 1884  
Lugger, 1st Rpt. St. Ent. Minn., pp. 71-77, Pl. VII, 1896.

EXHIBIT: Chrysalis and adult.

**GARDEN WEBWORM.***Loxostege similalis* Guen.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 39-40, 1903.

EXHIBIT: Adult and figure.

**GRANULATED CUTWORM.***Feltia annexa* Tr.

For description of eggs and larval stage see French, Can. Ent., Vol. XIV, pp. 207-210, 1882. For general account see Riley, Rpt. U. S. Dept. Agric., 1884, pp. 291-292, 1885.

EXHIBIT: Larva, pupa, adult, and figure.

**THE STRIPED CUTWORM.***Feltia subgothica* Haw.

For general account see Slingerland, Bul. 104, Cornell Univ. Agric. Expt. Sta., pp. 274-279, 1895.

EXHIBIT: Larva, adult, and figure.

**SHAGREENED CUTWORM.***Feltia malefida* Guen.

(Larvæ destroy young plants.)

For short account see Riley, Rpt. U. S. Dept. Agric., 1884, pp. 292-293, 1885.

EXHIBIT: Adult and figure.

**THE VARIEGATED CUTWORM.***Peridroma saucia* Hbn.

For general bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp., 46-64, 1902.

EXHIBIT: Larva, adult, and figure.

**THE BLACK CUTWORM.***Agrotis ypsilon* Rott.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 294-295, 1885.

EXHIBIT: Larva, adult, and figure.

**THE SPECKLED CUTWORM.***Mamestra subjuncta* G. & R.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, p. 296, 1885.

EXHIBIT: Larva, pupa, and adult.

**THE GLASSY CUTWORM.***Hadena devastatrix* Brace.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 296-297, 1885.

EXHIBIT: Adult.

**THE W-MARKED CUTWORM.***Noctua clandestina* Harr.

For general account see Slingerland, Bul. 104, Cornell Univ. Agr. Expt. Sta., pp. 571-574, 1895.

EXHIBIT: Larva and adult.

**FALL ARMY WORM.***Laphygma frugiperda* S. & A.

For full bibliography and life history see Chittenden, Bul. 29, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-45, 1901.

EXHIBIT: Larva, adult, and figure.

**THE CROSS-STRIPED CABBAGE WORM.***Evergestis rimosalis* Guen.(Formerly *Pionea*.)

For general article see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 54-59, 1902.

EXHIBIT: Larva, pupa, cocoon, adult, and figure.

**THE SALT-MARSH CATERPILLAR.***Estigmene acrea* Dru.(Formerly *Leucarcia*.)

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 43-44, 1903.

EXHIBIT: Larva, cocoon, and adult.

**THE CABBAGE LOOPER.***Autographa brassicae* Riley.(Formerly *Plusia*.)

For general account and life history see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 60-69, 1902.

EXHIBIT: Larva, cocoon, pupa, and adult.

**THE DIAMOND-BACK MOTH.***Plutella maculipennis* Curtis.(Formerly *P. cruciferarum*.)

For general account see Lugger, 1st Rpt. St. Ent. Minn., p. 79, Pl. VI, 1896.

EXHIBIT: Larva, cocoon, adult, and work.

**HARLEQUIN CABBAGE BUG.***Murgantia histrionica* Hahn.

(Feeds on cruciferous plants of all kinds.)

For general accounts see Riley, Rept. U. S. Dept. Agric. f. 1884, pp. 309-312, 1885; Smith, Bul. 121, N. J. Agr. Expt. Sta., pp. 3-6, 1897.

EXHIBIT: Eggs, nymph, and adult.

**THE TARNISHED PLANT-BUG.***Lygus pratensis* Linn.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 312-315, 1885.

EXHIBIT: Adult.

**THE EGG-PLANT FLEA-BEETLE.***Epitrix fuscula* Cr.

For general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 87-89, 1899.

EXHIBIT: Adult and figure.

**THE RED TURNIP BEETLE.***Entomoscelis adonidis* Pallas.

For partial life history, short accounts, and bibliography see Fletcher, Rpt. Ent. and Bot., Can. Dept. Agr., 1892, pp. 152-155, 1893; loc. cit., 1900, pp. 241, 1901; Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 49-53, 1902.

EXHIBIT: Figure.

**WESTERN CABBAGE FLEA-BEETLE.***Phyllotreta albionica* Lec.

EXHIBIT: Adult.

**HORSE-RADISH FLEA-BEETLE.***Phyllotreta armoracæ* Koch.

For general accounts see Chittenden, Ins. Life, Vol. VII, pp. 404-406, 1895; Bul. 9, n. s., Div. Ent., U. S. Dept. Agric., pp. 21-22, 1897.

EXHIBIT: Adult.

**THE WESTERN FLEA-BEETLE.***Phyllotreta pusilla* Horn.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 18-19, 1903.

EXHIBIT: Adult and figure.

**THE STRIPED FLEA-BEETLE.***Phyllotreta vittata* Fab.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 301-304, 1885.

EXHIBIT: Adult.

**WAVY-STRIPED FLEA-BEETLE.***Phyllotreta sinuata* Steph.

(Formerly *P. zimmermani*.)

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 304-308, 1885.

EXHIBIT: Adult.

**THE CAULIFLOWER PYRALID.***Pachyzancla bipunctalis* Fab.

(Formerly *Botis repetitalis*.)

For description and brief accounts see Comstock, Rpt. U. S. Dept. Agric. f. 1880, p. 276, 1881; Riley, Rpt. U. S. Dept. Agric. f. 1883, pp. 128-129, 1884.

EXHIBIT: Pupa and adult.

**THE ZEBRA CATERPILLAR.***Mamestra picta* Harr.

For bibliography and general life history see Felt, 14th Rpt. N. Y. St. Ent., pp. 201-207, 1898.

EXHIBIT: Larva, pupa, and adult.

**THE CABBAGE MAGGOT.***Pegomya brassicæ* Bouché.

(Formerly *Anthomyia*.)

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 319-321, 1885.

EXHIBIT: Adult.

**THE CABBAGE APHIS.***Aphis brassicæ* Linn.

For general account see Riley, Rpt. U. S. Dept. Agric. f. 1884, pp. 317-319, 1885.

EXHIBIT: Adult and work.

**IMPORTED CABBAGE WEBWORM.***Hellula undalis* Fab.

For general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 51-57, 1899.

EXHIBIT: Larva, pupa, adult, and figure.

**THE CABBAGE CURCULIO.***Ceutorhynchus rapæ* Gyll.

For general account and partial life history see Chittenden, Bul. 23, n. s., Div. Ent., U. S. Dept. Agric., pp. 39-50, 1900.

EXHIBIT: Adult and figure.

**THE IMPORTED CABBAGE LEAF-MINER.***Scaptomyza graminum* Fall.

(Formerly *Oscinis brassicæ*.)

See Riley, Rpt. U. S. Dept. Agric. f. 1884, p. 322, 1885. For short account see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 76-77, 1902.

EXHIBIT: Adult.

**INSECTS INJURIOUS TO POTATO.****THE RINGED MILLPEDE.***Cambala annulata* Say.

EXHIBIT: Figure.

**THE SHORT-WINGED MOLE-CRICKET.***Scapteriscus abbreviatus* Scudd.

For general account see Chittenden, Bul. 40, Div. Ent., U. S. Dept. Agric., pp. 117-118, 1903. For account of an allied species, *S. didactylus* Latr., see Barrett, Bul. 2, Porto Rico Agric. Expt. Sta., 1902.

EXHIBIT: Adult.

**POTATO-TUBER WORM; TOBACCO SPLIT-WORM.***Phthorinæa operculella* Zell.

(Formerly *Lita* and *Gelechia solanella*. Works in stems and tubers.)

For general account see Riley and Howard, Insect Life, Vol. IV, pp. 239-242, 1892; Howard, Farmers' Bul. 120, U. S. Dept. Agric., pp. 19-22, 1900.

EXHIBIT: Adult and figure.

**THE POTATO-STALK WEEVIL.***Trichobaris trinotata* Say.

For life history and general account see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 9-19, 1902.

EXHIBIT: Adult and work.

**STALK BORER.***Papaipema nitela* Guen.

(Formerly *Gortyna* and *Hydræcia*. Bores in stems of various plants.)

For general account see Bird, Can. Ent., Vol. XXX, pp. 127-128, 1898.

EXHIBIT: Adult.

**THE LITTLE GREEN TORTOISE BEETLE.***Cassida pallidula* Boh.

(Formerly *C. texana*.)

For short account see Riley, Amer. Nat., vol. 17, p. 1070, October [17 Sept.], 1883.

EXHIBIT: Adult.

**THE GOLDEN TORTOISE BEETLE.***Coptocyclus bicolor* Fab.(Formerly *C. aurichalcea*.)

For general account see Sanderson, Bul. 59, Md. Agr. Expt. Sta., pp. 139-140, 1899.

EXHIBIT: Adult.

**COLORADO POTATO BEETLE.***Leptinotarsa decemlineata* Say.(Formerly *Doryphora*.)

For general account of life history see Smith, Rpt. N. J. Agric. Expt. Sta. f. 1895, pp. 452-458, 1896.

EXHIBIT: Egg, larva, pupa, adult, figure, and the following enemies: *Brachinus kansanus* Lec., *Chilocorus bivulnerus* Mels., *Coccinella sanguinea* Linn., *Coccinella novemnotata* Hbst., *Harpalus caliginosus* Fab., *Hippodamia convergens* Güer., *Hippodamia glacialis* Fab., *Lebia atriventris* Say, *Lebia grandis* Htz., *Megilla maculata* DeG., *Nezara hilaris* Say, *Pasimachus elongatus* Lec., *Podisus spinosus* Dall., *Polistes pallipes* Lep., and *Tetracha virginica* Linn.**BOGUS POTATO BEETLE.***Leptinotarsa juncta* Germ.(This species exhibited merely on account of similarity to preceding species. It feeds on wild Solanum [*Solanum* spp.].)

EXHIBIT: Adult.

**THREE-LINED POTATO BEETLE.***Lema trilineata* Ol.

For general account see Riley, 1st Rpt. St. Ent. Mo., pp. 99-100, 1869.

EXHIBIT: Adult and figure.

**THE WHITE BLISTER BEETLE.***Macrobasis albida* Say.

For brief account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 26, 1903.

EXHIBIT: Adult.

**THE ASH-GRAY BLISTER BEETLE.***Macrobasis unicolor* Kby.

For general account see Chittenden, Yearbook, U. S. Dept. Agric. f. 1898, pp. 249-250, 1899.

EXHIBIT: Adult.

**THE STRIPED BLISTER BEETLE.***Epicauta vittata* Fab.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 22-23, 1903.

EXHIBIT: Adult.

**BLACK BLISTER BEETLE.***Epicauta pennsylvanica* DeG.

For brief account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric. p. 25, 1903.

EXHIBIT: Adult.

**THE CROW BLISTER BEETLE.***Epicauta corvina* Lec.

For brief notice see Comstock, Rpt. U. S. Comm. Agric. f. 1879, p. 251, 1880.

EXHIBIT: Adult.

**THE GRAY BLISTER BEETLE.***Epicauta cinerea* Först.

For brief account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., p. 24, 1903.

EXHIBIT: Adult.

**THE SPOTTED BLISTER BEETLE.***Epicauta maculata* Say.

For general accounts see Saunders, Bul. 57, S. Dak. Agric. Expt. Sta., p. 52, 1898;  
Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 24-25, 1903.

EXHIBIT: Adult and figure.

**THE EGG-PLANT FLEA-BEETLE.***Epitrix fuscata* Cr.

For general account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric.,  
pp. 87-89, 1899.

EXHIBIT: Adult.

**INSECTS INJURIOUS TO SWEET POTATOES.**

For general bulletin see Sanderson, Sweet Potato Insects, Bul. 59, Md. Agric.  
Expt. Sta., 1900.

**SWEET-POTATO ROOT-BORER.***Cylas formicarius* Fab.

EXHIBIT: Adult and work.

**SWEET-POTATO HAWK-MOTH.***Phlegethontius convolvuli* Linn.

EXHIBIT: Adult.

**THE SWEET-POTATO PLUME-MOTH.***Pterophorus monodactylus* Linn.

EXHIBIT: Adult.

**LARGER SWEET-POTATO SAWFLY.***Schizocerus privatus* Nort.

For general account see Marlatt, Insect Life, Vol. V, pp. 24-27, fig. 6, 1892.

EXHIBIT: Adult and figure.

**SWEET-POTATO FLEA-BEETLE.***Chaetocnema confinis* Cr.

EXHIBIT: Adult.

**THE CUCUMBER FLEA-BEETLE.***Epitrix cucumeris* Harr.

For short account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric.,  
pp. 89-90, 1899.

EXHIBIT: Adult.

**THE MOTTLED TORTOISE BEETLE.***Coptocycla signifera* Hbst.

(Formerly *C. guttata*.)

EXHIBIT: Adult.

**BLACK-LEGGED TORTOISE BEETLE.***Cassida nigripes* Ol.

EXHIBIT: Adult and work.

**TWO-STRIPED TORTOISE BEETLE.***Cassida bivittata* Say.

EXHIBIT: Adult.



**THE GREEN TORTOISE BEETLE.***Physonota unipunctata* Say.

For brief notices see Hamilton, Can. Ent., Vol. XVI, pp. 134-135, 1884, and Caulfield, l. c., p. 227.

EXHIBIT: Adult.

**THE ARGUS TORTOISE BEETLE.***Chelymorpha argus* Licht.

(Also called *C. cassidea*.)

EXHIBIT: Adult.

**INSECTS INJURIOUS TO TOMATO.****NORTHERN TOBACCO WORM; TOMATO WORM.***Phlegethontius quinque maculata* Haw.

(Formerly *Protoparce celeus*.)

For general account see Howard, Farmers' Bul. 120, U. S. Dept. Agric., pp. 10-14, 1900.

EXHIBIT: Larva and adult.

**SOUTHERN TOBACCO WORM; HORNBLOWER.***Phlegethontius sexta* Joh.

(Formerly *Protoparce carolina*.)

For general accounts see Howard, Farmers' Bul. 120, U. S. Dept. Agric., pp. 10-14, 1900; Alwood, Bul. 17, n. s., Div. Ent., U. S. Dept. Agric., pp. 72-74, 1898.

EXHIBIT: Larva and adult.

**THE STALK BORER.***Papaipema nitela* Guen.

For general accounts see Bird, Can. Ent., Vol. XXX, pp. 127-128, 1898; Lügger, 4th Rpt. State Ent. Minn., pp. 167-168, 1899.

EXHIBIT: Pupa and adult.

**THE COMMELINA OWLET-MOTH.***Prodenia commelinæ* S. & A.

For life history and general account see Chittenden, Bull. 27, n. s., Div. Ent., U. S. Dept. Agric., pp. 59-64, Pl. IV, fig. 1, 1901.

EXHIBIT: Larva and adult.

**CORN-EAR WORM; COTTON BOLLWORM.***Heliothis obsoleta* Fab.

(Feeds also on tobacco and tomato; formerly *H. armiger* Hbn.)

For life history and general account see Quaintance and Brues, Bul. 50, Bur. Ent., U. S. Dept. Agric., 1905; also Quaintance and Bishopp, Farmers' Bul. 212, 1905.

EXHIBIT: Larva and adult.

**INSECTS INJURIOUS TO ASPARAGUS.**

For general article on asparagus insects see Chittenden, Bul. 10, n. s., pp. 54-62, 1898.

**THE ASPARAGUS MINER.***Agromyza simplex* Loew.

For general account see Sirrine, Bul. 189, N. Y. Agric. Exp. Sta., pp. 277-282, 1900.

EXHIBIT: Adult.

**LOPIDEA MEDIA** Say.

EXHIBIT: Adult.

**THE LESSER LOCUST.***Melanoplus atlantis* Riley.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 178-183; pl. 12, fig. 7, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 26-27, 1891.

EXHIBIT: Adult.

**THE TWO-STRIPED LOCUST.***Melanoplus bivittatus* Say.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 363-368, pl. 24, fig. 5, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 31-32, 1891.

EXHIBIT: Adult and figure.

**RED-LEGGED LOCUST.***Melanoplus femur-rubrum* DeG.

For bibliography and general accounts see Scudder, Proc. U. S. N. M., Vol. XX, pp. 278-285, pl. 1, fig. h; pl. 19, figs. 1-4, 1897; Riley, Bul. 25, Div. Ent., U. S. Dept. Agric., pp. 27-28, 1891.

EXHIBIT: Adult.

**MELANOPLUS PROPINQUUS** Scudd.

For original description see Scudder, Proc. U. S. N. M., Vol. XX, pp. 285-286, pl. 17, fig. 9, 1897.

EXHIBIT: Adult.

**TWELVE-SPOTTED ASPARAGUS BEETLE.***Crioceris duodecimpunctata* Linn.

For detailed account see Chittenden, Yearbook, U. S. Dept. Agric., 1896, pp. 349-352, 1897.

EXHIBIT: Adult, figure, and adult of enemy, *Podisus spinosus* Dall.

**THE ASPARAGUS BEETLE.***Crioceris asparagi* Linn.

For detailed account see Chittenden, Yearbook, U. S. Dept. Agric., 1896, pp. 341-349. For bibliography and general account see Lintner, 11th Rpt. St. Ent. N. Y., pp. 177-188, 1896.

EXHIBIT: Larva, adult, figure, and enemy *Stiretrus anchorago* Fab.

**THE TWELVE-SPOTTED CUCUMBER BEETLE.***Diabrotica duodecimpunctata* Ol.

For general accounts and remedies see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 12-13, 1903; Quaintance, Bul. 26, n. s., Div. Ent., U. S. Dept. Agric., pp. 35-40, 1900.

EXHIBIT: Adult and figure.

**FALSE BUD-WORM; COTTON BOLLWORM.***Heliothis obsoleta* Fab.

(Formerly *H. armiger* Hbn. For full life-history exhibit see under cotton and corn.)

For life history and general account see Quaintance and Brues, Bul. 50, Bur. Ent., U. S. Dept. Agric., 1905; also Quaintance and Bishopp, Farmers' Bul. 212, U. S. Dept. Agric., 1905.

EXHIBIT: Adult.

**ZEBRA CATERPILLAR.***Mamestra picta* Harr.

For general account see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 42-43, 1903.

EXHIBIT: Larva, adult, and figure.

**THE PRETTY CUTWORM.***Mamestra legitima* Grt.

For brief account see Howard, Farmers' Bul. 120, U. S. Dept. Agric., pp. 24-25, fig. 20, 1900.

EXHIBIT: Larva, adult, and figure.

**CRANBERRY SPANWORM.***Cleora pampinaria* Guen.

For general account see Smith, Farmers' Bul. 178, pp. 19-21, 1903.

EXHIBIT: Larva, pupa, and adult.

**THE RED-BANDED LEAF-ROLLER.***Eulia triferana* Walk.

(Formerly *Lophoderus*.)

For brief account see Lugger, 4th Rpt. State Entom. Minn., p. 231, 1899.

EXHIBIT: Larva, pupa, and adult.

**THE SULPHUR-COLORED TORTRIX.***Epagoge sulfureana* Clem.

(Formerly *Dichelia*.)

For brief account see Lugger, 4th Rpt. State Entom. Minn., pp. 232-233, 1899.

EXHIBIT: Pupa and adult.

**INSECTS INJURIOUS TO CUCURBITS.****SQUASH-VINE BORER.***Melittia satyriniformis* Hbn.

(Formerly *Aegeria cucurbitæ* and *M. ceto*.)

For life history and general accounts see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 34-40, 1899; Cir. 38, Div. Ent., U. S. Dept. Agric., 1899.

EXHIBIT: Larva, pupa, cocoon, adult, and figure.

**PICKLE WORM.***Diaphania nitidalis* Cram.

(Formerly *Eudiotis* and *Margaronia*.)

For general accounts and bibliography see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 40-42, 1899; Lintner, 11th Rpt. N. Y. St. Ent., pp. 126-133, 1896.

EXHIBIT: Pupa, cocoon, adult, and figure.

**MELON CATERPILLAR.***Diaphania hyalinata* Linn.

(Formerly *Eudiotis* and *Margaronia*.)

For general accounts and bibliography see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 42-44, 1899; Lintner, 11th Rpt. N. Y. St. Ent., pp. 134-138, 1896.

EXHIBIT: Larva, pupa, adult, and figure.

**NORTHERN LEAF-FOOTED PLANT-BUG.***Leptoglossus oppositus* Say.

For life history and general account see Chittenden, Bul. 33, n. s., Div. Ent., U. S. Dept. Agric., pp. 18-25, 1902.

EXHIBIT: Nymph, adult, and figure.

**STRIPED CUCUMBER BEETLE.***Diabrotica vittata* Fab.

For general accounts see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 48-51, 1899; Cir. 31, Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Adult, work, and figure.

**TWELVE-SPOTTED CUCUMBER BEETLE.***Diabrotica duodecimpunctata* Ol.

For general articles see Chittenden, Bul. 43, Div. Ent., U. S. Dept. Agric., pp. 12-13, 1903; Quaintance, Bul. 26, n. s., pp. 35-40, 1900.

EXHIBIT: Adult.

**THE CUCUMBER FLEA-BEETLE.***Epitrix cucumeris* Harr.

For short account see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 89-90, 1899.

EXHIBIT: Adult and figure.

**THE PUNCTURED FLEA-BEETLE.***Psylliodes punctulata* Mels.

For brief account see Forbes and Hart, 21st Rpt. St. Ent. Ill., p. 124, 1900.

EXHIBIT: Adult.

**THE HORNED SQUASH-BUG.***Anasa armigera* Say.

For general accounts see Chittenden, Can. Ent. Vol. XXX, pp. 239-240, 1898; Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 28-34, 1899.

EXHIBIT: Eggs, nymph, adult, and figure.

**THE COMMON SQUASH-BUG.***Anasa tristis* DeG.

For general accounts see Chittenden, Cir. 39, Div. Ent., U. S. Dept. Agric., 1899; Bul. 19, n. s., pp. 20-28, 1899.

EXHIBIT: Eggs, nymph, adult, and figure.

**THE SQUASH LADYBIRD.***Epilachna borealis* Fab.

For bibliography and life history see Chittenden, Bul. 19, n. s., Div. Ent., U. S. Dept. Agric., pp. 11-20, 1899.

EXHIBIT: Larva, pupa, adult, and work.

**INSECTS INJURIOUS TO STORED PRODUCTS.****THE WOLF MOTH.***Tinea granella* Linn.

For general account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 31-34, 1897.

EXHIBIT: Pupa and adult.

**MEDITERRANEAN FLOUR-MOTH.***Ephestia kuehniella* Zell.

For general account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 8-9, 1897.

EXHIBIT: Larva, pupa, cocoon, adult, and figure.

**DRIED-CURRENT MOTH.***Ephestia cautella* Wlk.

For short account (under *E. cahiritella*) see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 7-9, 1897.

EXHIBIT: Larva, adult, and figure.

**THE MEAL SNOUT-MOTH.***Pyralis farinalis* Linn.(Formerly *Asopia*.)

For short account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 10-11, 1897.

EXHIBIT: Larva, pupa, cocoon, and adult.

**THE INDIAN-MEAL MOTH.***Plodia interpunctella* Hbn.(Formerly *Ephestia*.)

For general account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 9-10 1897.

EXHIBIT: Larva, pupa, adult, work, and figure.

**ANGOUMOIS GRAIN MOTH.***Sitotroga cerealella* Ol.(Formerly *Gelechia*.)

For general account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 6-7, 1897.

EXHIBIT: Cocoon, adult, work, and figure.

**THE FOREIGN GRAIN-BEETLE.***Cathartus advena* Waltl.

For short account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 17-18, 1897.

EXHIBIT: Adult, work, and figure.

**RED OR SQUARE-NECKED GRAIN-BEETLE.***Cathartus gemellatus* Duv.

For short account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., p. 17, 1897.

EXHIBIT: Adult and figure.

**THE SAW-TOOTHED GRAIN-BEETLE.***Silvanus surinamensis* Linn.

For short account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 16-17, 1897.

EXHIBIT: Adult and figure.

**THE MERCHANT GRAIN-BEETLE.***Silvanus mercator* Fauv.

For short account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., p. 12, 1897.

EXHIBIT: Adult.

**PHARAXONOTHA KIRSCHII Reitt.**

For short notice see Chittenden, Insect Life, Vol. VII, p. 327, 1895.

EXHIBIT: Adult.

**THE FLAT GRAIN-BEETLE.***Læmophloeus pusillus* Sch.

For short account see Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., p. 129, 1902.

EXHIBIT: Adult.

**TYPHCEA FUMATA Linn.**

EXHIBIT: Adult and work.

**THE BLACK CARPET BEETLE.***Attagenus piceus* Ol.

For general account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 15-19, 1897.

EXHIBIT: Adult.

**TROGODERMA TARSALE Mels.**

For general account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 19-21, 1897.

EXHIBIT: Adult.

**THE CABINET BEETLE.**

*Anthrenus verbasci* Linn.

(Formerly *A. varius*.)

For short account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 22-23, 1897.

EXHIBIT: Adult and work.

**THE MEAL SAP-BEETLE.**

*Carpophilus dimidiatus* Fab.

EXHIBIT: Adult.

**THE CORN SAP-BEETLE.**

*Carpophilus pallipennis* Say.

EXHIBIT: Adult.

**THE CADELLE.**

*Tenebroides mauritanicus* Linn.

(Formerly *Trogosita*.)

For general account see Chittenden, Farmers' Bul. 45, U. S. Dept. Agric., pp. 18-19, 1897.

EXHIBIT: Larva, adult, work, and figure.

**THE DARK MEAL-WORM.**

*Tenebrio obscurus* Fab.

For short account see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., p. 15, 1897.

EXHIBIT: Larva, pupa, adult, and figure.

**THE YELLOW MEAL-WORM.**

*Tenebrio molitor* Linn.

For general account see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., pp. 14-15, 1897.

EXHIBIT: Larva, pupa, adult, and figure.

**THE WHITE-MARKED SPIDER BEETLE.**

*Plinus fur* Linn.

For general account see Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., pp. 127-128, 1902.

EXHIBIT: Adult.

**THE BROWN SPIDER BEETLE.**

*Plinus brunneus* Dufts.

For short account see Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., p. 128, 1902.

EXHIBIT: Adult.

**THE DRUG-STORE BEETLE.**

*Sitodrepa panicea* Linn.

(Listed as *Anobium* in foreign catalogues.)

For general account see Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., pp. 124-126, 1897.

EXHIBIT: Adult, work, and figure.

**THE CIGARETTE BEETLE.***Lasioderma testaceum* Duft.(Formerly *L. serricorne*.)

For general account see Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., pp. 126-127, 1897.

EXHIBIT: Adult and figure.

**THE LARGER GRAIN-BORER.***Dinoderus truncatus* Horn.

For short account see Chittenden, Insect Life, Vol. VII, p. 327, 1895.

EXHIBIT: Adult.

**THE RUST-RED FLOUR-BEETLE.***Tribolium ferrugineum* Fab.

For general account see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., pp. 12-13, 1897.

EXHIBIT: Adult.

**THE CONFUSED FLOUR-BEETLE.***Tribolium confusum* Duv.

For general account see Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., pp. 113-115, 1902.

EXHIBIT: Adult and figure.

**THE SLENDER-HORNED FLOUR-BEETLE.***Echocerus maxillosus* Fab.

For short account see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., p. 13, 1897.

EXHIBIT: Adult and figure.

**THE BROAD-HORNED FLOUR-BEETLE.***Echocerus cornutus* Fab.

For short account see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., p. 13, 1897.

EXHIBIT: Adult and figure.

**THE SMALL-EYED FLOUR-BEETLE.***Palorus ratzeburgi* Wissm.

For short account see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., pp. 13-14, 1897.

EXHIBIT: Adult and figure.

**THE DEPRESSED FLOUR-BEETLE.***Palorus subdepressus* Woll.

EXHIBIT: Adult.

**ALPHITOBIOUS PICEUS OL.**

EXHIBIT: Adult.

**BROAD-NOSED GRAIN WEEVIL.***Caulophilus latinasus* Say.

For general account see Chittenden, Bul. 8, n. s., Div. Ent., U. S. Dept. Agric., pp. 13-14, 1897.

EXHIBIT: Adult.

**THE GRANARY WEEVIL.***Calandra granaria* Linn.

For short account, see Chittenden, Farmers' Bul. 45, rev. ed., U. S. Dept. Agric., pp. 4-5, 1897.

EXHIBIT: Adult, work, and figure.

**BRACHYTARSUS ALTERNATUS Say.**

For life history, notes, and general accounts, see Quaintance, Ent. News, pp. 1-3, plate, 1897.

EXHIBIT: Adult and figure.

**HOUSEHOLD INSECTS.**

For general account of household insects see Howard, Marlatt, and Chittenden, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., 1902. Contains articles on all the insects represented in the exhibit.

**THE HOUSE CENTIPEDE.**

*Scutigera forceps* Raf.

(While this animal is not an insect, but belongs to the class Myriapoda, it is so regularly associated with the insects that it may appropriately be presented with them. It feeds on flies, moths, roaches, etc.)

For general article see Marlatt, Cir. 48, Div. Ent., U. S. Dept. Agric., 1902.

EXHIBIT: Figure.

**THE SILVER FISH.**

*Lepisma domestica* Pack.

For general article see Marlatt, Cir. 49, Div. Ent., U. S. Dept. Agric., 1902.

EXHIBIT: Figure.

**THE BOOK-LOUSE.**

*Troctes divinatoria* Müll.

(Formerly *Psocus* and *Atropos*.)

EXHIBIT: Figure.

**THE WHITE ANT.**

*Leucotermes flavipes* Koll.

(Formerly *Termes*.)

For general account see Marlatt, Cir. 50, Div. Ent., U. S. Dept. Agric., 1902.

EXHIBIT: Adult and figure.

**THE AMERICAN COCKROACH.**

*Periplaneta americana* Linn.

For general article see Marlatt, Cir. 51, Div. Ent., U. S. Dept. Agric., pp. 1-8, 1902.

EXHIBIT: Adult and figure.

**THE BLACK "BEETLE."**

*Blatta orientalis* Linn.

For general article see Marlatt, Cir. 51, Div. Ent., U. S. Dept. Agric., pp. 9-10, 1902.

EXHIBIT: Adult and figure.

**THE CROTON BUG.**

*Blattella germanica* Linn.

(Formerly *Ectobia*.)

For general article see Marlatt, Cir. 51, Div. Ent., U. S. Dept. Agric., pp. 10-11, 1902.

EXHIBIT: Adult.

**THE HOUSE CRICKET.**

*Gryllus domesticus* Linn.

EXHIBIT: Adult.

**THE CASE-MAKING CLOTHES MOTH.**

*Tinea pellionella* Linn.

For general article see Marlatt, Cir. 36, Div. Ent., U. S. Dept. Agric., pp. 1-4, 1898.

EXHIBIT: Adult and figure.



**THE CARPET MOTH.***Trichophaga tapetzella* Linn.(Formerly *Tinea*.)

For general article see Marlatt, Cir. 36, Div. Ent., U. S. Dept. Agric., p. 5, 1898.

EXHIBIT: Figure.

**THE WEBBING CLOTHES MOTH.***Tineola biselliella* Hum.(Formerly *Tinea*.)

For general article see Marlatt, Cir. 36, Div. Ent., U. S. Dept. Agric., pp. 4-5, 1898.

EXHIBIT: Adult and figure.

**THE RED-LEGGED HAM BEETLE.***Necrobia rufipes* DeG.(Formerly *Corynetes*.)

EXHIBIT: Adult and figure.

**THE LARDER BEETLE.***Dermestes lardarius* Linn.

EXHIBIT: Adult and figure.

**THE CARPET BEETLE OR "BUFFALO MOTH."***Anthrenus scrophulariæ* Linn.

For general article see Howard, Cir. 5, Div. Ent., U. S. Dept. Agric., 1894.

EXHIBIT: Adult and figure.

**THE CHEESE OR HAM SKIPPER.***Piophilæ casei* Linn.

EXHIBIT: Adult.

**THE FRUIT OR VINEGAR FLY.***Drosophila ampelophila* Loew.

For general accounts see Howard, Bul. 4, n. s., Div. Ent., U. S. Dept. Agric., pp. 109-111, 1896; Proc. Wash. Acad. Sci., Vol. II, pp. 589-590, pl. 31, fig. 2, 1900.

EXHIBIT: Adult and figure.

**THE LITTLE RED ANT.***Monomorium pharaonis* Linn.

For general article see Marlatt, Cir. 34, Div. Ent., U. S. Dept. Agric., pp. 1-2, 1898. For bibliography and general account see Lintner, 11th Rpt. N. Y. St. Entom., pp. 109-114, 1896.

EXHIBIT: Adult and figure.

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**INSECTS WHICH MAY SPREAD DISEASE.**

General articles: Howard, Farmers' Bulletin 155, U. S. Dept. Agric., 1902; also Bul. 30, n. s., Div. Ent., U. S. Dept. Agric., pp. 39-45, 1901.

**THE YELLOW-FEVER MOSQUITO.***Stegomyia fasciata* Fab.(Is the intermediate host for the parasite of yellow fever. Formerly *Culex*.)

EXHIBIT: Adult and figure.

**THE MALARIA MOSQUITO.***Anopheles maculipennis* Meig.(The most important of the mosquitoes transmitting malaria. Formerly *A. quadrimaculatus*.)

EXHIBIT: Adult and figure.

**THE GREEN BOTTLE FLY.***Lucilia caesar* Linn.

For general article see Howard, Cir. 35, Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Adult and figure.

**THE STABLE FLY.***Stomoxys calcitrans* Linn.

For special article see Howard, Proc. Wash. Acad. Sci., Vol. II, pp. 577-579, fig. 27, 1900.

EXHIBIT: Adult and figure.

**THE HIPPELATES FLY.***Hippelates flavipes* Loew.

(Facilitates the spread of the disease known as "pink-eye.")

EXHIBIT: Adult and figure.

**THE BROWN DUNG FLY.***Scatophaga furcata* Say.

EXHIBIT: Adult and figure.

**THE SHINING EXCREMENT FLY.***Morellia micans* Macq.

EXHIBIT: Adult and figure.

**THE LITTLE HOUSE FLY.***Homalomyia brevis* Rond.

EXHIBIT: Adult and figure.

**THE FRUIT OR VINEGAR FLY.***Drosophila ampelophila* Loew.

EXHIBIT: Adult and figure.

**THE SCREW-WORM FLY.***Chrysomya macellaria* Fab.(Formerly *Comptosmia*.)

For special article see Howard, Proc. Wash. Acad. Sci., Vol. II, p. 562, 1900.

EXHIBIT: Adult and figure.

**THE CATTLE TICK.***Boophilus annulatus* Say.

(Very common on cattle below the Texas fever line, and known to be responsible for transmission of Texas fever among cattle.)

EXHIBIT: Eggs, adult, and figure.

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**INSECTS WHICH DIRECTLY INJURE OR ANNOY HUMAN BEINGS.****THE HOUSE FLY.***Musca domestica* Linn.

For general article see Howard, Cir. 35, Div. Ent., U. S. Dept. Agric., 1898.

EXHIBIT: Adult and figure.

**THE SOUTHERN BUFFALO GNAT.***Simulium pecuarum* Riley.

For general article and full life history see Osborn, Bul. 5, n. s., Div. Ent., U. S. Dept. Agric., pp. 41-52, 1896.

EXHIBIT: Adult and figure.

**THE CAT AND DOG FLEA.***Ctenocephalus canis* Curtis.(Formerly *Pulex serraticeps* Gerv.)

For general account see Howard and Marlatt, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., pp. 24-31, 1902. For full bibliography see Baker, Proc. U. S. N. M., Vol. XXVII, p. 438, 1904.

EXHIBIT: Figure.

**THE BLOOD-SUCKING CONE-NOSE.***Conorhinus sanguisuga* Lec.

For general article see Howard and Marlatt, Bul. 4, n. s., rev. ed., Div. Ent., U. S. Dept. Agric., pp. 38-42, 1902.

EXHIBIT: Egg, nymph, adult, and figure.

**THE HOUSE MOSQUITO.***Culex pipiens* Linn.

For general article and life history see Howard, Bul. 25, n. s., Div. Ent., U. S. Dept. Agric., pp. 22-28, 1900. Treated as *C. pungens* Wied.

EXHIBIT: Adult and figure.

**THE BEDBUG.***Clinocoris lectularia* Linn.(Formerly *Acanthia*, *Cimex*, and *Klinophilos*.)

For general article see Marlatt, Cir. 47, Div. Ent., U. S. Dept. Agric., 1902.

EXHIBIT: Nymph, adult, and figure.

**THE BLACK "BEETLE."***Blatta orientalis* Linn.

For general article see Marlatt, Cir. 51, Div. Ent., U. S. Dept. Agric., pp. 9-10, 1902.

EXHIBIT: Adult and figure.

**THE RED BUG.***Leptus irritans* Riley.

For general article see H. Osborn, Bul. 5, n. s., Div. Ent., U. S. Dept. Agric., pp. 251-253, 1896.

EXHIBIT: Figure.

**THE HEAD LOUSE.***Pediculus capitis* DeG.

For general article see H. Osborn, Bul. 5, n. s., Div. Ent., U. S. Dept. Agric., pp. 166-167, 1896.

EXHIBIT: Figure.

**THE BODY LOUSE.***Pediculus vestimenti* Leach.

For general article see H. Osborn, Bul. 5, n. s., Div. Ent., U. S. Dept. Agric., pp. 167-168, 1896.

EXHIBIT: Figure.

**THE CRAB LOUSE.***Phthirus inguinalis* Leach.

For general article see H. Osborn, Bul. 5, n. s., Div. Ent., U. S. Dept. Agric., pp. 165-166, 1896.

EXHIBIT: Eggs, adult, and figure.

## INSECTS INJURIOUS TO DOMESTIC ANIMALS.

For general account with illustrations of many of the insects affecting domestic animals see H. Osborn, Bul. 5, n. s., Div. Ent., U. S. Dept. Agric., pp. 1-302, 1896.

### THE SOUTHERN BUFFALO GNAT.

*Simulium pecuarum* Riley.

EXHIBIT: Adult and figure.

### THE TURKEY GNAT.

*Simulium meridionale* Riley.

EXHIBIT: Puparium, adult, and figure.

### AMERICAN GADFLY.

*Tabanus americanus* Forst.

EXHIBIT: Adult.

### THE GRAY-STRIPED GREEN-HEAD.

*Tabanus lineola* Fab.

EXHIBIT: Adult and figure.

### THE BLACK GADFLY.

*Tabanus atratus* Linn.

EXHIBIT: Larva, adult, figure, and figure of parasite *Phanurus tabanivorus* Ashm.

### THE GREENHEAD.

*Tabanus costalis* Wied.

EXHIBIT: Adult.

### TABANUS EXUL O. S.

EXHIBIT: Adult.

### TABANUS PUNCTIFER O. S.

EXHIBIT: Adult.

### TABANUS CINCTUS Fab.

EXHIBIT: Adult.

### MEXICAN GADFLY.

*Tabanus mexicanus* Linn.

EXHIBIT: Adult.

### THE BLACK-STRIPED GADFLY.

*Tabanus nigrovittatus* Macq.

EXHIBIT: Adult.

### THE BLACK-STRIPED EAR-FLY.

*Chrysops vittatus* Wied.

EXHIBIT: Adult and figure.

### CHRYSOPS ATROPOS O. S.

EXHIBIT: Adult.

### CHRYSOPS HILARIS O. S.

EXHIBIT: Adult.

### THE STABLE FLY.

*Stomoxys calcitrans* Linn.

For special article see Howard, Proc. Wash. Acad. Sci., Vol. II, pp. 577-579, fig. 27, 1900.

EXHIBIT: Adult and figure.

**THE HORSE BOT-FLY.***Gastrophilus equi* Fab.

EXHIBIT: Eggs, larva, puparia, adult, and figure.

**THE "CHIN" FLY.***Gastrophilus nasalis* Linn.

EXHIBIT: Adult.

**THE WARBLE FLY.***Hypoderma bovis* DeG.

(A European species.)

EXHIBIT: Eggs, adult, and figure.

**THE OX BOT; OX WARBLE.***Hypoderma lineata* Vill.

EXHIBIT: Larva, adult, and figure.

**THE SHEEP BOT FLY; HEAD MAGGOT.***Estrus ovis* Linn.

EXHIBIT: Larva, puparia, adult, and figure.

**THE HORN FLY.***Hæmatobia serrata* R. D.

For special article see Riley and Howard, Insect Life, Vol. II, pp. 93-103.

EXHIBIT: Puparium, adult, and figure.

**THE SHEEP TICK.***Melophagus ovinus* Linn.

EXHIBIT: Adult and figure.

**THE SCREW-WORM FLY.***Chrysomyia macellaria* Fab.(Formerly *Comptosmyia*.)

For special article see Howard, Proc. Washington Acad. Sci., Vol. II, p. 562, 1900.

EXHIBIT: Adult and figure.

**THE CAT AND DOG FLEA.***Ctenocephalus canis* Curtis.(Formerly *Pulex serraticeps* Gerv.)

For full bibliography see Baker, Proc. U. S. N. M., Vol. XXVII, p. 438, 190

EXHIBIT: Figure.

**THE SUCKING HORSE-LOUSE.***Hæmatopinus asini* Linn.

EXHIBIT: Figure.

**THE SHORT-NOSED OX-LOUSE.***Hæmatopinus eurysternus* Nitsch.

EXHIBIT: Figure.

**THE LONG-NOSED OX-LOUSE.***Hæmatopinus vituli* Linn.

EXHIBIT: Adult and figure.

**THE CATTLE LOUSE.***Trichodectes scalaris* Nitsch.

EXHIBIT: Adult and figure.

**THE SHEEP LOUSE.***Trichodectes sphærocephalus* Nitsch.

EXHIBIT: Adult and figure.

## FOREST INSECTS.

For treatises and shorter articles see Packard, 5th Rpt. U. S. Ent. Comm., 1886-90; Hopkins, Buls. 21, 28, 32 and 48, Div. Ent., U. S. Dept. Agric., Buls. 16, 17, 31, 32, 35, 36, and 56, W. Va. Agric. Exp. Sta., and Yearbk., U. S. Dept. Agric. f. 1904, pp. 387-404, 1905; Felt, 7th Ann. Rpt. Forest, Fish, and Game Comm., pp. 479-534, 1903.

### INSECTS INJURIOUS TO FORESTS IN THE NORTHWESTERN AND NORTHEASTERN UNITED STATES.

#### NORTHWESTERN STATES.

#### INJURY BY AMBROSIA BEETLES. ORDER COLEOPTERA, FAMILY SCOLYTIDÆ.

##### CASE 1.

##### 1. The Western Platypus.

*Platypus* n. sp.

Excavates long, branching galleries in the sapwood and heartwood of injured, dying, and recently felled Douglas spruce, western hemlock, and giant arborvitæ. California to northern Oregon; also reported from Washington.

EXHIBIT: Adult and work.

##### 2. Western Hemlock Wood-Stainer.

*Gnathotrichus sulcatus* Lec.

Excavates numerous branching galleries from a central burrow, the broods living in closely joined side chambers; in the sapwood and heartwood of western hemlock, Douglas spruce, giant arborvitæ, and lowland fir. California to northern Washington; common in hemlock.

EXHIBIT: Adult and work.

##### 3. The Western Pine Wood-Stainer.

*Gnathotrichus* n. sp.

Excavates transverse galleries in the surface of the wood and branching ones deep in the sapwood and heartwood; the broods living in short side chambers; western yellow pine and Douglas spruce. Cascade and Rocky Mountain region, California to northeastern Washington.

EXHIBIT: Adult and work.

##### 4. The Eastern Pine Wood-Stainer.

*Gnathotrichus materiarius* Fitch.

Excavates several branching galleries from a single-entrance burrow, the broods living in short side chambers in sapwood and heartwood of injured, dying, and recently felled pine and spruce. Eastern United States and Canada. Very common and injurious.

EXHIBIT: Adult and work.

### 5. The Spruce Timber-Beetle.

*Trypodendron bivittatus* Kirby.

Excavates several branching galleries from a single entrance burrow, the brood developing in short side chambers in the sapwood of injured, dying, and recently felled spruce, pine, hemlock, cedar, fir, and larch. Eastern, northeastern, and western United States, Canada, and British Columbia to Alaska; very injurious.

EXHIBIT: Adult and work.

### 6. The Birch Timber-Beetle.

*Trypodendron* n. sp.

Excavates branching galleries from an entrance burrow and the broods develop in short side chambers in sapwood and heartwood of paper birch. Kootenai, Idaho, and northwestern Maine; also other birches in Maine.

EXHIBIT: Adult and work.

### 7. The Cosmopolitan Timber-Beetle.

*Xyleborus saxeseni* Ratz.

Excavates branching galleries and broad brood chambers from an entrance burrow in sapwood and heartwood of Douglas spruce in Oregon, red oak in Maine, apple and hemlock in West Virginia, and oak, beech, maple, lime tree, poplar, pine, spruce, and fruit trees in Europe. Widely distributed in different countries of the world, especially in Europe, North America, and Japan.

EXHIBIT: Adult and work.

## INJURY BY BARK-BEETLES. ORDER COLEOPTERA, FAMILY SCOLYTIDÆ.

### CASE 2.

### 8. The Hairy Cryphalus.

*Cryphalus* n. sp.

Excavates broad, irregular chambers in dying and dead bark of lowland fir. Port Williams, Wash.

EXHIBIT: Adult and work.

### 9. The Western Oak Bark-Beetle.

*Pityophthorus pubipennis* Lec.

Excavates two transverse galleries from a central entrance burrow in the bark of injured, dying, and recently felled California black oak, Pacific post oak, and possibly other oaks. California to Oregon.

EXHIBIT: Adult and work.

### 10. The Densely-punctured Bark-Beetle.

*Pityophthorus confinis* Lec.

Excavates a large central chamber and several radiating primary galleries, with very deep egg cavities, in living bark of injured, dying, and recently felled western yellow pine. Northern California, eastern Washington, and western Idaho.

EXHIBIT: Adult and work.

### 11. The Lodgepole Pine Bark-Beetle.

*Pityophthorus* n. sp.

Excavates radiating curved longitudinal galleries from a medium-sized central chamber in living bark on large branches of dying lodgepole pine. Eastern Washington.

EXHIBIT: Adult and work.

### 12. The Knobcone Pine Bark-Beetle.

*Pityophthorus* n. sp.

Excavates several radiating galleries from a large central chamber in living bark on branches of injured and dying knobcone pine and western yellow pine. Berkeley, Cal., and Albany, Oreg.

EXHIBIT: Work.

**13. The Monterey Pine Twig-Beetle.***Pityophthorus puncticollis* Lec.

Excavates small, radiating, curved galleries from a large central chamber in twigs and branches of dying and felled Monterey pine, shore pine, western yellow pine, knobcone pine, Sitka spruce, and mountain or silver pine. Middle California to northern Washington.

EXHIBIT: Adult and work.

**14. The Sitka Spruce Twig-Beetle.***Pityophthorus nitidulus* Mann.

Excavates three or four radiating galleries from a medium-sized central chamber in bark of Sitka spruce, silver pine, shore pine, and Douglas spruce. California to Alaska, coast and Cascade region. Common.

EXHIBIT: Adult and work.

**15. The Jeffrey Pine Twig-Beetle.***Pityophthorus* n. sp.

Excavates small central chambers and long longitudinal galleries in living bark of twigs and branches on living, injured, dying, and recently felled Jeffrey pine and western yellow pine. Mount Shasta, California, to Albany, Oreg., and Moscow Mountains, Idaho.

EXHIBIT: Adult and work.

**16. The Smaller Fir Bark-Beetle.***Pityophthorus* n. sp.

Excavates transverse galleries from a central chamber in the bark of dying lowland fir and mountain or silver pine. Kootenai, Idaho.

EXHIBIT: Adult and work.

**CASE 3.****17. The Mountain Pine Wood-Engraver.***Pityogenes* n. sp.

Excavates large central chambers and numerous curved primary galleries in the bark and surface of wood of injured, dying, and recently felled mountain or silver pine and lowland fir. Kootenai, Idaho.

EXHIBIT: Adult and work.

**18. The Yellow Pine Wood-Engraver***Pityogenes carinulatus* Lec.

Excavates numerous radiating galleries from a large central chamber in living bark and surface of wood of injured, dying, and recently felled western yellow pine and Jeffrey pine. California to eastern Washington, western Idaho, and Colorado.

EXHIBIT: Adult and work.

**19. The Western Fir Bark-Beetle.***Tomicus* n. sp.

Excavates several radiating, curved, transverse galleries from a small central chamber in the bark and surface of wood of injured, declining, or dying lowland fir, and white fir. Mount Shasta, California, and Moscow Mountains, Idaho. Common.

EXHIBIT: Adult and work.

**20. The Smaller Sugar Pine Tomicus.***Tomicus latidens* Lec.

Excavates two or three longitudinal galleries from a small central chamber in living bark of branches of dying and recently felled sugar pine. Grants Pass, Oregon; also California to Colorado.

EXHIBIT: Adult and work.



**21. The Sitka Spruce Tomicus.***Tomicus concinnus* Mann.

Excavates irregular central chambers, and three or four short curved galleries, in partly living bark of injured, dying, and recently felled Monterey pine, shore pine, and Sitka spruce. Coast region, middle California to Alaska.

EXHIBIT: Adult and work.

**22. The Oregon Tomicus.***Tomicus oregoni* Eichh.

Excavates two or three longitudinal galleries from a small central chamber in the bark of living, injured, dying, and recently felled western yellow pine, lodgepole pine, silver pine, and probably other pines in the Northwest. Destructive to the western yellow pine in western Idaho.

EXHIBIT: Adult and work.

**23. The Western Five-Spined Tomicus.***Tomicus confusus* Lec.

Excavates one to three long longitudinal galleries from a medium-sized central chamber in the living bark of injured, dying, and recently felled western yellow pine. Mount Shasta, California, and Grants Pass, Oregon; also recorded from southern California and Arizona.

EXHIBIT: Adult and work.

**CASE 4.****24. The Silver Pine Tomicus.***Tomicus* n. sp.

Excavates very long, straight, longitudinal, and transverse curved galleries from a large central chamber in the bark of living, injured, dying, and recently felled mountain or silver pine and sugar pine. Grants Pass, Oregon, and Kootenai, Idaho. Common and evidently a destructive species.

EXHIBIT: Adult and work.

**25. The Four-Spined Tomicus.***Tomicus integer* Eichh.

Excavates several longitudinal primary galleries from a large central chamber in living bark of western yellow pine and lodgepole pine. Eastern Washington; also recorded from California, Washington, and Colorado.

EXHIBIT: Adult and work.

**CASE 5.****26. The Sugar Pine Wood-Engraver.***Carpoborus* n. sp.

Excavates several long, curved, longitudinal galleries in the surface of the wood from a deep central chamber in injured or dying sugar pine, western yellow pine, Douglas spruce, and Sitka spruce. Grants Pass, St. Helen, and Ahlers, Oregon; also middle California.

EXHIBIT: Adult and work.

**27. The Western Cedar Bark-Beetle.***Phloeosinus punctatus* Lec.

Excavates a single straight longitudinal or curved subtransverse gallery from a basal chamber in the living bark and surface of wood of injured, dying, and recently felled giant arborvitae, incense cedar, and Port Orford cedar. California to northern and eastern Washington and Rocky Mountain region. Common.

EXHIBIT: Adult and work.

**28. The Sitka Spruce Dolurgus.***Dolurgus pumilis* Mann.

Excavates irregular, confused galleries in dying and dead bark of dead and felled Sitka spruce. Southern and central Oregon.

EXHIBIT: Adult and work.

## CASE 6.

**29. The Redwood Bark-Beetle.***Phlaeosinus sequoiae* Hopk.

Excavates a long, straight, longitudinal gallery from a basal chamber in living bark of injured, declining, and recently felled redwood and giant arborvitae. California to northern Washington. Very common in redwood.

EXHIBIT: Adult and work.

## CASE 7.

**30. The Western Pine-Destroyer.***Dendroctonus brevicomis* Lec.

Excavates long, winding galleries through the bark of living and injured western yellow pine and sugar pine. Cascade and Rocky Mountain region, New Mexico to British Columbia. Closely allied with the destructive pine bark-beetle of the East and capable of great destruction of the largest and best timber.

EXHIBIT: Adult and work.

## CASE 8.

**31. The Dark-Red Turpentine-Beetle.***Dendroctonus valens* Lec.

The largest North American bark-beetle. Excavates very broad and long primary galleries, the broods developing in broad side chambers in the bark of living, injured, dying, and recently felled western yellow pine, lodgepole pine, and doubtless most of the other western pines. California to British Columbia and eastward to Kansas and northern Michigan. A variety extends into the eastern United States. Common and injurious, but not necessarily destructive to living timber.

EXHIBIT: Adult and work.

**32. The Mountain Pine Dendroctonus.***Dendroctonus* n. sp.

A medium-sized black bark-beetle, excavating very long, winding galleries in the bark of living, injured or declining, and recently felled mountain or silver pine and sugar pine. Northern California to Washington eastward to Idaho and Montana. Very common and capable of great destruction of the best timber.

EXHIBIT: Adult and work.

## CASES 9 AND 10.

**33. The Douglas Spruce Dendroctonus.***Dendroctonus* n. sp.

(*Dendroctonus similis* in Bul. 21, n. s., Division of Entomology.)

A large, reddish bark-beetle, excavating long longitudinal, slightly curved primary galleries in the bark of living, injured, and recently felled Douglas spruce and western larch. New Mexico to British Columbia, Pacific coast and eastward through the mountain regions. Very common and capable of destroying much valuable timber.

EXHIBIT: Adult and work.

## CASE 10.

**34. The Western Pine Hylurgops.***Hylurgops subcostulatus* Mann.

Excavates short, slightly curved, longitudinal galleries in the living bark of injured, dying, and recently felled sugar pine, silver pine, western yellow pine, lodgepole pine, and probably other pines on the Pacific coast. Cascade and Rocky Mountain region. Common.

EXHIBIT: Adult and work.

**35. The Sitka Spruce Hylurgops.***Hylurgops rugipennis* Mann.

Excavates a short, curved, longitudinal and subtransverse gallery from an entrance in the living bark of injured, dying, and recently felled Sitka spruce and shore pine. Coast region, California to Washington and Alaska.

EXHIBIT: Adult and work.

## CASE 11.

**36. The Fir Wood-Engraver.***Hylesinus* n. sp.

Excavates a small central chamber at one side of the junction of two short transverse, slightly curved egg galleries, which are deeply grooved in the surface of the wood; the larvæ also groove or engrave the surface of the wood in an ornamental manner. Infests the lowland fir and Douglas spruce. Port Williams and Port Angeles, Wash. Common.

EXHIBIT: Adult and work.

**37. The Larger Fir-Tree Bark-Beetle.***Hylesinus granulatus* Lec.

Excavates one or two transverse galleries from a central burrow in the bark and surface of wood near the base of dying lowland fir. Port Williams, Wash.; also recorded from California.

EXHIBIT: Adult and work.

**38. The Grand Fir Bark-Beetle.***Hylesinus* n. sp.

Excavates two separate, transverse galleries from a central entrance burrow in the bark and surface of wood of recently felled lowland, or grand, fir. Port Angeles and Port Williams, Wash.

EXHIBIT: Work.

**39. The Shore Pine Hylesinus.***Hylesinus sericeus* Mann.

Excavates one short, longitudinal gallery from the entrance burrow and small side cavity in living bark of injured, dying, and recently felled shore pine. Newport and Seaside, Oreg. Common. Also recorded from California and Alaska.

EXHIBIT: Adult and work.

**40. The Ash-Tree Bark-Beetle.***Hylesinus aculeatus* Say.

Excavates two long, transverse galleries, from a central entrance burrow and side cavity in the living bark of injured, dying, and recently felled ash. Atlantic to Pacific coast. Common. Specimens from Oregon ash, St. Helen, Oreg.

EXHIBIT: Adult and work.

**41. The White-Alder Bark-Beetle.***Hylesinus aspericollis* Lec.

Excavates a moderately long, longitudinal gallery from a basal entrance burrow in the bark of living, injured, dying, and recently felled white alder. Newport, Detroit, and Astoria, Oreg., and Seattle, Wash.; also recorded from California. A destructive enemy, causing the death of large trees.

EXHIBIT: Adult and work.

**42. The Western Hemlock Bark-Beetle.***Hylesinus* n. sp.

Excavates one or two transverse galleries from a central burrow in bark and surface of wood of living, injured, and recently felled western hemlock, causing "gum spot" defects in the wood of living trees, and may cause the death of the best timber. Newport, Oreg., and Port Angeles, Wash.

EXHIBIT: Adult and work.

## CASE 12.

**43. The Douglas Spruce Hylesinus.***Hylesinus nebulosus* Lec.

Excavates two short, straight, longitudinal galleries from a central entrance burrow in the living bark of injured, dying, and recently felled Douglas spruce. California to British Columbia, and eastward to Idaho and Colorado. Very common.

EXHIBIT: Adult and work.

**44. The Single Spine Scolytus.***Scolytus unispinosus* Lec.

Excavates two short, straight, longitudinal galleries from an entrance burrow in living bark of injured, dying, and recently felled Douglas spruce and western larch. Pacific coast, Cascade and Rocky Mountain region. Common.

EXHIBIT: Adult and work.

**45. The Fir-Branch Scolytus.***Scolytus* n. sp.

Excavates two short, longitudinal galleries from a central burrow and side cavity in living bark of the branches of recently felled lowland fir. Cascade Mountains near Grants Pass, Oregon.

EXHIBIT: Work.

**46. The Smaller Fir-Tree Scolytus.***Scolytus* n. sp.

Excavates two transverse or oblique, slightly curved galleries from a central entrance burrow and side cavity in the bark and surface of wood of injured and dying lowland fir. Kootenai, Idaho.

EXHIBIT: Adult and work.

**CASE 13.****47. The California White Fir Scolytus.***Scolytus præceps* Lec.

Excavates two nearly straight, transverse galleries from a central entrance burrow and basal cavity in living bark and surface of wood of California white fir. Mount Shasta, California, and lowland fir, Sand Point, Idaho. Closely allied in character and habits to No. 48.

EXHIBIT: Adult and work.

**48. The Fir Tree Destroyer.***Scolytus subscaber* Lec.

Excavates two long, nearly straight, transverse galleries from a central entrance burrow and central or side cavity in bark of living, injured, and declining lowland fir, white fir, and doubtless other species of fir. California to British Columbia, eastern Washington, and western and northern Idaho. The healed-over wounds in living trees cause serious defects and rapid decay of the heartwood.

EXHIBIT: Adult and work.

**BARK AND WOOD-BORING GRUBS. ORDER COLEOPTERA, FAMILIES BUPRESTIDÆ AND CERAMBYCIDÆ.****CASE 14 AND PART OF CASE 15.****49. The Douglas Spruce Bark-Borer.***Asemum nitidum* Lec.

A round-headed bark-boring grub, boring transverse and winding galleries in the bark of living, injured, and declining Douglas spruce and western hemlock. Cascade Mountains, near Detroit, Oreg., St. Helen, Oreg., and Port Williams, Wash. A very common and destructive enemy of the Douglas spruce. The healed-over wounds in the wood cause serious defects, and the trees die from successive attacks.

EXHIBIT: Adult and work.

**50. The White-Pine Sawyer.***Monohammus scutellatus* Say.

A large, whitish, round-headed bark and wood boring grub, excavating burrows through the sapwood and deep into the heartwood of fire-scorched, declining, dying, dead, and recently felled mountain or silver pine. Kootenai, Idaho, and white pine in eastern and northern United States. Common and destructive.

EXHIBIT: Adult and work.

**51. The Ponderous Sawyer.***Ergates spiculatus* Lec.

An exceedingly large, round-headed, bark and wood boring grub, excavating large and deep burrows in the sapwood and heartwood of dead and felled western yellow pine; destructive to the wood of timber that has been dead or felled one or more years. Southern Oregon.

EXHIBIT: Adult and work.

**52. The Western Cedar Bark-Borer.***Hylotrupes amethystinus* Lec.

A medium-sized bark and wood boring grub, excavating long, winding burrows in the living bark and surface of the wood and boring into the sapwood of injured, dying, and recently felled giant arborvitæ and incense cedar. Northern California and Washington.

EXHIBIT: Work.

**53. The Bronze Birch-Borer.***Agrilus anxius* Gory.

A long, flat-headed, slender wood-boring grub, excavating long, winding burrows in the bark and surface of the wood of living and injured birch, aspen, and cottonwood trees in northern Idaho, northern Maine, and mountains of West Virginia; also recorded from northern Michigan, New York, Pennsylvania, Virginia, Quebec, and Ontario. A destructive enemy of the birches, aspen, and cottonwood.

EXHIBIT: Adult and work.

**INJURY BY GALL INSECTS. ORDER HYMENOPTERA.****PART OF CASE 15.****54. Bird's-eye Pine.***Chalcidid?*

A common condition of the wood of the western yellow pine, evidently caused by a minute four-winged gnat, fragments of which were found in pitch galls in the bark of the main stem of young living pine. The formation of corky wood cells around the accumulation of pitch in the wound produces in the subsequent layers of wood the wavy and so-called bird's-eye effect in the wood of larger trees. Insects found in specimen at Albany, Oreg. Specimen of wood from Grants Pass, Oreg.

EXHIBIT: Work.

**55. The Oak-Twig Ormyrus.***Ormyrus* sp.

A minute four-winged gnat breeding in small gall-like cavities in the living bark on the branches and twigs of the Pacific post oak in western Oregon, causing the small and large oak trees to present a dying appearance, due to the great number of dying twigs and dead leaves. The healed-over wounds produce deformed branches and defective wood.

EXHIBIT: Work.

**INJURY BY BARK AND WOOD-BORING GRUBS. ORDER COLEOPTERA, FAMILY BUPRESTIDÆ.****CASE 16.****56. The Western Hemlock Bark-Borer.***Melanophila drummondi* Kirby.

A medium-sized, flat-headed, bark-boring grub, excavating shallow, winding burrows through the inner layers of bark of living, injured, and recently felled western hemlock and Douglas spruce; California to northern and eastern Washington and western Idaho, and in the noble fir near Detroit, Oreg. A very common and destructive enemy, killing the largest and best trees, or causing serious "gum spot" defects in the wood of living ones.

EXHIBIT: Adult and work.

# INJURY BY BARK-WEEVILS. ORDER COLEOPTERA, FAMILY CURCULIONIDÆ.

## PART OF CASE 17.

### 57. The Sugar Pine Bark-Weevil.

*Pissodes* sp.

Adult snout-beetle deposits eggs in the outer bark of young living and injured sugar pine, producing small whitish grubs which mine through the inner bark and change to the adult in oval cavities excavated in the surface of the wood, causing the death or abnormal development of the trees. Grants Pass, Oreg.

EXHIBIT: Work.

### 58. The Douglas Spruce Twig-Weevil.

*Curculionid*.

A small snout-beetle which deposits eggs in cavities in the bark of the small central shoots and terminal twigs of young, living Douglas spruce. The small whitish grubs mine through the inner bark and enter the pith to change to the adult, killing the twigs and causing a deformed development of the tree. St. Helen, Oreg.

EXHIBIT: Work.

### 59. The Pine Fungus-Gall Weevil.

*Curculionid*.

A small snout-beetle breeding in the bark and wood of a common fungus gall on the shore pine and western yellow pine, causing the death of the branches and young trees. Newport, Oreg., and Moscow Mountains, Idaho.

EXHIBIT: Work.

# INJURY TO DEAD WOOD AND BARK BY POWDER-POST BEETLES. ORDER COLEOPTERA, FAMILY PTINIDÆ.

## PART OF CASE 17.

### 60. The Pine Wood Perforator.

*Ptinid* ?

Small white grubs burrow through the dead wood of western yellow pine logs, causing rapid decay. Grants Pass, Oreg.

EXHIBIT: Work.

### 61. The Giant Arborvitæ Ptinid.

*Ptinid*.

Small white grubs boring in the dead heartwood of living giant arborvitæ, contributing to the rapid decay of the heartwood. Port Angeles, Wash.

EXHIBIT: Work.

### 62. The Giant Arborvitæ Dryophilus.

*Dryophilus* sp.

A small whitish grub and brownish beetle, breeding in the outer bark of the giant arborvitæ. Its work is very common. Detroit, Oreg., and Port Angeles, Wash. "Represents a European family and genus heretofore unrecorded from North America." (Schwarz.)

EXHIBIT: Work.

# INJURY TO TWIGS BY BARK MAGGOTS. ORDER DIPTERA, FAMILY CECIDOMYIIDÆ.

## PART OF CASE 17.

### 63. The Pine Twig-Maggot.

*Cecidomyiid*.

Minute reddish maggot, living in the bark of terminal twigs of the western yellow pine, causing the leaves to turn yellow and die. Moscow Mountains, Idaho. Common.

EXHIBIT: Work.

# INJURY BY GALL INSECTS. ORDER HEMIPTERA, FAMILY APHIDIDÆ.

## CASE 18.

### 64. The Sitka Spruce Gall-Aphis.

*Chermes sibiricus* ?

A minute insect forming cone-like galls on the terminal twigs of the Sitka spruce at Newport, Oreg. Very common and injurious to young trees.

EXHIBIT: Work.

### 65. The Engelmann Spruce Gall-Aphis.

*Chermes sibiricus* ? var.

Same habit as 64, but probably a variety or different species. Common on Engelmann spruce at Sand Point, Idaho.

EXHIBIT: Work.

# INJURY BY CICADA. ORDER HEMIPTERA, FAMILY CICADIDÆ.

## CASE 18.

### 66. Small Western Cicada.

*Cicada* sp.

Injuring twigs of Douglas spruce, St. Helen, Oreg.

EXHIBIT: Adult and work.

# INJURY BY TWIG-MINER. ORDER LEPIDOPTERA, FAMILY TORTRICIDÆ.

## CASE 18.

### 67. The Pine Twig-Miner.

*Tortricid*.

A caterpillar of a moth with similar habits to that of the pine moth of Nantucket, excavating burrows through the pith of the terminal twigs and shoots of young western yellow pine. Moscow Mountains, Idaho, where it was common and quite injurious.

EXHIBIT: Work.

## NORTHEASTERN STATES.

# INJURY BY BARK AND TWIG-BEETLES. ORDER COLEOPTERA, FAMILY SCOLYTIDÆ.

## CASE 19.

### 68. The Balsam Fir Cryphalus.

*Cryphalus* n. sp.

Excavates irregular, broad, elongate egg chambers to one side of the entrance burrow in the bark and surface of wood, the larval galleries radiating in all directions and deeply grooved in the surface of the wood of the branches of dying and dead balsam fir. Shores and islands of Parmacheene Lake and Rump Mountain, Maine.

EXHIBIT: Work.

### 69. The Spruce Cryphalus.

*Cryphalus* n. sp.

Excavates broad transverse egg chambers in the bark and surface of wood; the larval galleries but slightly grooved in the surface of the wood of dying and dead red spruce and balsam fir. Islands and shores of Parmacheene Lake and near Portland, Me. Common in bark of small dying and dead red spruce.

EXHIBIT: Adult and work.

**70. The Minute Oak Bark-Beetle.***Pityophthorus minutissimus* Zimm.

Excavates two straight transverse galleries from a central entrance burrow and elongate longitudinal chamber in the bark and surface of wood of branches on living, dying, and felled trees, rarely in the thicker bark on the main trunk, of red oak, southern Maine, and other oaks in the eastern United States.

EXHIBIT: Adult and work.

**71. The Minute Birch Bark-Beetle.***Pityophthorus* n. sp.

Excavates galleries like that of the minute oak bark-beetle (70) in the living and dying bark of branches of the paper birch. Southern Massachusetts.

EXHIBIT: Adult and work.

**72. The White Pine Twig-Beetle.***Pityophthorus* n. sp.

Excavates several long winding galleries from a central chamber in the bark; deeply grooved in the surface of the wood of small dying and broken branches of white pine. Camp Caribou, Maine.

EXHIBIT: Adult and work.

**73. The Minute Spruce-Twig Wood-Engraver.***Pityophthorus* n. sp.

Excavates a large central chamber and several curved galleries in the bark and deeply grooved in the surface of the wood of small branches of felled red spruce. Shores of Barkers Lake, Maine, and West Virginia.

EXHIBIT: Work.

**74. The Spruce Wood-Engraver.***Pityophthorus cariniceps* Lec.

Excavates many short, radiating, curved galleries from a large central chamber in the bark and surface of the wood of twigs and branches of dying trees and main stem of young dying red spruce. Western Maine to Morgantown, W. Va., and Detroit, Mich.

EXHIBIT: Adult and work.

**75. The Black Spruce Wood-Engraver.***Pityophthorus* n. sp.

Excavates short longitudinal galleries from the entrance burrow in the bark and surface of wood of small dying black spruce. Shores of Parmacheene Lake, north-western Maine; Peakes Island, in Casco Bay, Maine, and Adirondacks, New York.

EXHIBIT: Adult and work.

**76. The White Pine Wood-Engraver.***Pityogenes* n. sp.

Excavates numerous short, radiating, curved egg galleries from a large central chamber in the bark and surface of wood of large and small branches and small dying white pine. Northern Maine to West Virginia. Common. Heretofore recognized as *Pityophthorus sparsus* Lec.

EXHIBIT: Adult and work.

**CASE 20.****77. The Small Red Spruce Bark-Beetle.***Dryocetes* n. sp.

Excavates three or four short, curved galleries from a small central cavity in the bark and surface of the wood of injured, dying, and recently felled red, white, and black spruce, Maine to northern New York, and the red spruce in the mountains of West Virginia. Common.

EXHIBIT: Adult and work.



**78. The American Spruce Bark-Beetle.***Dryocates* n. sp.

Excavates short, irregular galleries in the living bark of injured, dying, and recently felled red, white, and black spruce in Maine, spruce and pine in West Virginia; also in spruce and pine in Europe. Widely distributed in Europe and eastern North America.

EXHIBIT: Adult and work.

**79. The Birch Bark-Beetle.***Dryocates* n. sp.

Excavates irregular galleries in the bark of living, injured, and dying birch. Northwestern Maine and mountains of West Virginia. Common. Under favorable conditions causes the death of large trees.

EXHIBIT: Adult and work.

**80. The Balsam Fir Bark-Beetle.***Tomicus balsameus* Lec.

Excavates several radiating, curved, transverse galleries from a small central chamber in the living and dying bark of injured and dying balsam fir and red and black spruce. Western Maine; also recorded from northern Michigan and New York.

EXHIBIT: Adult and work.

**81. The White Spruce Bark-Beetle.***Tomicus* n. sp.

Excavates several long, radiating, longitudinal egg galleries from a large central chamber in the living bark of recently felled white spruce. Near Camp Caribou, northwestern Maine.

EXHIBIT: Adult and work.

**82. The Hudson Bay Tomicus.***Tomicus* n. sp.

Excavates one or two longitudinal primary galleries from a central burrow and small central chambers in the living bark of recently felled white and red spruce. Northwestern Maine; also recorded from Canada and British Columbia.

EXHIBIT: Adult and work.

**CASE 21.****83. The Spruce Bark-Beetle.***Polygraphus rufipennis* Kirby.

Excavates three or four short, curved egg galleries from a large central chamber in the surface of the inner bark, through the bark and slightly grooving the surface of the wood of injured, declining, dying, and recently felled black, red, and white spruce, and rare in balsam fir. Very common throughout the northern and Appalachian spruce regions.

EXHIBIT: Adult and work.

**84. The Cedar Bark-Beetle.***Phloeosinus dentatus* Lec.

Excavates a single short longitudinal egg gallery from the entrance burrow and basal chambers in the bark and surface of wood of injured and dying red juniper and arborvitæ. Eastern and northwestern United States and Canada. Common.

EXHIBIT: Adult and work.

**86. The Parmacheene Bark-Beetle.***Xylochinus* n. sp.

Excavates short, irregular egg galleries in the dead bark of small red spruce and balsam fir. Islands of Parmacheene Lake, Maine.

EXHIBIT: Work.

**87. The Red Spruce Scolytus.***Scolytus* n. sp.

Excavates two longitudinal egg galleries from a central entrance burrow and small lateral cavity in the living bark of branches of dying and recently felled red spruce. Northwestern Maine and Peak's Island, near Portland, Me.

EXHIBIT: Adult and work.

**CASE 22.****88. The Minute Spruce Bark-Beetle.***Crypturgus atomus* Lec.

Enters the galleries of other bark-beetles, from which it excavates numerous very small, irregular galleries through the inner bark of dying and dead black and red spruce and white pine. Northwestern Maine.

EXHIBIT: Adult and work.

**89. The Spruce-Destroying Beetle.***Dendroctonus piceaperda* Hopk.

Excavates long, longitudinal egg galleries from a basal entrance burrow in the bark, and grooving the wood of living and injured red and white spruce trees. Very destructive to the largest and best timber. Northern Maine to New York and New Brunswick. This is the great enemy of the red and white spruce of the northeastern spruce region, having caused the death and loss of a vast amount of timber. For methods of preventing losses, see Bulletin 28, n. s., Division of Entomology, U. S. Department of Agriculture.

EXHIBIT: Adult and work.

**ENEMIES OF BARK-BEETLES. BIRDS AND INSECTS.****PART OF CASE 23.****90. Work of woodpeckers in spruce bark, when infested with the spruce-destroying beetle.**

These birds are exceedingly beneficial in destroying the greatest enemy of the spruce.

EXHIBIT: Work.

**91. The Cloudy Bark-Beetle Destroyer.***Thanasimus nubilus* Kl.

The adults feed on the adults of the spruce-destroying and other bark-beetles, and its young or larvæ prey upon their developing broods. Very beneficial. The specimen of bark shows the pupa case of the Clerid in an egg gallery of the spruce-destroying beetle.

EXHIBIT: Adult and work.

**92. Polyporus volvatus** Peck.

A fungus growing from entrance and exit burrows of the spruce-destroying beetle in the bark and the spruce-timber beetle in the wood, and from those of other bark and wood boring insects in dying and recently dead spruce trees killed by the spruce-destroying beetle in the Northeast and the fir-destroying *Scolytus* in the Northwest. The presence of this fungus usually indicates the destructive work of insects.

EXHIBIT: Work.

**93. Parasitic Enemy of the Spruce-Destroying Beetle.***Bracon simplex* Cress.

The adult deposits eggs in the bark with the developing brood of the bark-beetle; the young maggot-like larvæ feed upon and kill the young. Very common and beneficial. Maine to West Virginia. Also attacks numerous other bark-infesting insects. The bark specimen shows the cocoon in which the matured larva develops to the adult.

EXHIBIT: Adult and work.

**INJURY BY BARK AND WOOD BORING-GRUBS. ORDER COLEOPTERA, FAMILIES BUPRESTIDÆ, CERAMBYCIDÆ, AND MELANDRYIDÆ.**

**CASE 24.**

**94. Buprestid.**

Work of flat-headed bark and wood miner in wood of dying balsam fir.  
EXHIBIT: Work.

**95. The Destructive Spruce-Wood Borer.**

*Tetropium cinnamopterum* Kirby.

A slender, round-headed bark and wood boring grub which excavates winding burrows through the inner bark and surface of the wood, then enters the sapwood and changes to the adult. Infests slightly injured, declining, and recently felled red, black, and white spruce. Maine to West Virginia. Common, and very destructive to the wood of dying trees, and may also cause the death of slightly injured ones.

EXHIBIT: Adult and work.

**96. The Cedar Tree Borer.**

*Hylotrupes ligneus* Fab.

A slender, whitish, bark and wood boring grub, excavating winding burrows in the bark and surface of the wood of living arborvitæ, causing the death of the trees and serious defects in the wood of living ones. Common in northwestern Maine.

EXHIBIT: Adult and work.

**97. The Blazed-Tree Borer.**

*Serropalpus barbatus* Schall.

A slender, whitish, wood-boring grub, which enters at wounds on living trees and bores deep into the sapwood and heartwood, causing a rapid decay of the infested parts. Common in "blazed" wounds on balsam fir and spruce trees along the trails in northwestern Maine.

EXHIBIT: Work.

**98. The Mountain Ash Borer.**

*Saperda* sp.

A destructive enemy of the mountain ash, boring in the healthy wood of the main stem. Northwestern Maine.

EXHIBIT: Work.

**INSECT ENEMIES OF FORESTS IN GENERAL.**

**INJURING THE FOLIAGE.**

**CATERPILLARS OF BUTTERFLIES AND MOTHS. ORDER LEPIDOPTERA.**

**CASE 25.**

**99. The Violet-Tip Butterfly.**

*Polygonia interrogationis* Fab.

Larvæ on elm.

EXHIBIT: Adults, larva.

**100. The Mourning-Cloak Butterfly.**

*Euvanessa antiopa* Linn.

Larvæ on foliage of elm, willow, and poplar, sometimes defoliating trees.

EXHIBIT: Adults, larvæ and pupa.

**101. The Viceroy Butterfly.**

*Basilarchia archippus* Crám.

Larvæ on willow and poplar.

EXHIBIT: Adult.

**102. The Buff-Tipped Butterfly.***Limenitis bredowii* Hbn.

Larvæ on oak in California.

EXHIBIT: Adult.

**103. The Common Hackberry Butterfly.***Chlorippe celtis* Bd. & Lec.

Larvæ on hackberry.

EXHIBIT: Adult, pupa.

**104. The Pine Butterfly.***Neophasia menapia* Feld.

Larvæ defoliate pine in the Pacific States.

EXHIBIT: Adults.

**105. The Locust Leaf Folder.***Epargyreus (Eudamus) tityrus* Fab.

Larvæ on locust.

EXHIBIT: Adults, larva, pupa, cocoon.

**106. The Walnut Sphinx.***Cressonia juglandis* S. & A.

Larvæ on hickory and walnut.

EXHIBIT: Adults.

**107. The Pine Sphinx.***Lapara coniferarum* S. & A.

Larvæ on pine in the Eastern States.

EXHIBIT: Adults, larva.

**108. The Catalpa Sphinx.***Ceratonia catalpæ* Bd.

The larvæ feed upon and frequently defoliate catalpa wherever this tree is native.

EXHIBIT: Adult, larva.

**109. The Wavy Ash Sphinx.***Ceratonia undulosa* Walk.

Larvæ on ash.

EXHIBIT: Adult, larva.

**110. The Ash Sphinx.***Sphinx (Hyloicus) kalmiæ* S. & A.

Larvæ on ash in the Eastern States.

EXHIBIT: Adult.

**CASE 26.****111. The Four-Horned Sphinx.***Ceratonia amyntor* Hbn.

Larvæ on elm.

EXHIBIT: Adults, larva.

**112. The Western Cottonwood Sphinx.***Pachysphinx modesta* var. *occidentalis* Hy. Edw.

Larvæ on cottonwood in the Western States.

EXHIBIT: Adult.

**113. The Polyphemus Moth.***Telea polyphemus* Cram.

The large green larvæ occur on maple, oak, birch, and a variety of other forest trees.

EXHIBIT: Adult.

**114. The Hickory Horned Devil.***Citheronia regalis* Hbn.

Larvæ on hickory and walnut.

EXHIBIT: Adults, larva.

**115. The Imperial Moth.***Basilona imperialis* Dru.

The larvæ feed upon pine and many other species of coniferous and deciduous trees.

EXHIBIT: Adults, larva, pupa.

**116. The Orange-Striped Oak Worm.***Anisota senatoria* Hübn.

The larvæ defoliate oak in the Eastern States.

EXHIBIT: Adults, larvæ, pupæ.

**CASE 27.****117. The Spiny Oak Worm***Anisota stigma* Hbn.

Larvæ in large colonies on oak, sometimes defoliating trees. Eastern States.

EXHIBIT: Adults, larvæ, pupæ.

**118. The Green-Striped Maple Worm.***Anisota rubicunda* Fab.

Larvæ in colonies on maple, sometimes defoliating trees. Eastern States.

EXHIBIT: Adults, eggs, larvæ, pupæ.

**119. The Buck Moth.***Hemileuca maia* Dru.

The black spiny larvæ feed in colonies on oak. Eastern States.

EXHIBIT: Adults.

**120. The Pale Tussock Caterpillar.***Halisidota tessellaris* Harr.

The pale-yellow, black tufted larvæ feed on elm, sycamore, maple, walnut, oak, etc.

EXHIBIT: Adults.

**121. The Pine Tussock Caterpillar.***Euschausia argentata* Pack.

The larvæ feed in colonies on pine, cedar, Douglas spruce, etc. Northwestern States.

EXHIBIT: Adults, pupæ, cocoon, work.

**122. The Hickory Tussock Caterpillar.***Halisidota caryæ* Harr.

The white wooly caterpillars, tufted with black, feed in large colonies on hickory, walnut, elm, and other forest trees, sometimes becoming very destructive. Eastern States.

EXHIBIT: Adults, cocoons.

**123. The Oak Tussock Caterpillar.***Halisidota maculata* Harr.

The orange and black tufted larvæ on oak, elm, alder, etc. Northern States.

EXHIBIT: Adults.

**124. The Fall Webworm.***Hyphantria textor* Harr.

Larvæ construct large tents on most species of deciduous forest trees. At times very destructive.

EXHIBIT: Adults, larvæ, pupa.

**125. The American Dagger-Moth.***Apatela americana* Harr.

The larvæ occur on maple, elm, and a variety of other forest trees.

EXHIBIT: Adults, larva.

**126. The Smeared Dagger-Moth.***Apatela obliterata* S. & A.

Larvæ occur on nearly all varieties of deciduous trees.

EXHIBIT: Adults, larvæ.

**CASE 28.****127. The Underwing Moths.**Genus *Catocala*.

The large gray larvæ of these moths, of which there are many species in the United States, are nocturnal in habit, and conceal themselves during the day in the crevices of the bark on tree trunks and limbs. They devour the foliage of oak, hickory, walnut, poplar, birch, and other species of forest trees.

EXHIBIT: Adults of the following species: *Catocala relecta* Grote, *Catocala vidua* S. & A., *Catocala obscura* Strk., *Catocala cecrogama* Guen., *Catocala unijuga* Walk., *Catocala concumbens* Walk., *Catocala cara* Guen.

**128. The Semi-Looping Maple Worm.***Homoptera lunata* Dru.

The slender green larvæ occur on maple, willow, etc.

EXHIBIT: Adults, larva, pupa.

**129. The California Phryganidia.***Phryganidia californica* Pack.

Larvæ on oak, sometimes defoliating trees in California.

EXHIBIT: Adults, larvæ.

**130. The Poplar Tent-Maker.***Melalopha inclusa* Hübn.

Larvæ construct small tents on aspen, cottonwood, and willow. Eastern States.

EXHIBIT: Adults, larva.

**131. The Black Hickory Caterpillar.***Datana integerrima* G. & R.

Larvæ in colonies on hickory and walnut, sometimes defoliating the trees. Eastern States.

EXHIBIT: Adult, larva, pupæ.

**132. The Yellow-Necked Apple-Tree Caterpillar.***Datana ministra* Dru.

Larvæ in colonies on birch, oak, and other forest trees, as well as on apple. Eastern States.

EXHIBIT: Adults, eggs, larvæ, pupa.

**133. The Striped Hickory Caterpillar.***Datana angusii* G. & R.

Larvæ in colonies on hickory and oak. Eastern States.

EXHIBIT: Adults.

**134. The Green Oak Caterpillar.***Nadata gibbosa* S. & A.

Larvæ on oak, maple, and other forest trees.

EXHIBIT: Adult, larvæ.

**135. The Rosy Hyparpax.***Hyparpax aurora* S. & A.

Larvæ on oak in Eastern States.

EXHIBIT: Adults.

## CASE 29.

**136. The Red-Humped Oak Caterpillar.***Symmerista albifrons* S. & A.

Larvæ on oak, sometimes defoliating trees in the Eastern States.

EXHIBIT: Adults, larva, pupa.

**137. The Rusty Tussock-Moth.***Notolophus antiqua* Linn.

Larvæ on most species of deciduous forest trees in America and Europe.

EXHIBIT: Adults.

**138. The California Tussock-Moth.***Hemerocampa vetusta* Bd.

Larvæ on various species of deciduous forest trees in California.

EXHIBIT: Adults, larva.

**139. The White-Marked Tussock-Moth.***Hemerocampa leucostigma* S. & A.

Larvæ sometimes defoliate elm, maple, and other deciduous forest trees in the Eastern States.

EXHIBIT: Adults, egg-mass, larva, cocoon.

**140. The Dark Tussock-Moth.***Olene achatina* S. & A.

Larvæ on various deciduous forest trees in the Eastern States.

EXHIBIT: Adult.

**141. The Brown-Tail Moth.***Euproctis chrysorrhæa* Linn.

Introduced from Europe and destructive to deciduous forest trees in Massachusetts and New Hampshire.

EXHIBIT: Adults.

**142. The Gypsy Moth.***Porthetria dispar* Linn.

Introduced from Europe and very destructive to nearly all deciduous and a few coniferous forest trees in Massachusetts. It has recently become established in portions of the city of Providence, Rhode Island.

EXHIBIT: Adults, larvæ.

**143. The Forest Tent-Caterpillar.***Malacosoma (Osiocampa) disstria* Hbn.

Larvæ at times very destructive to maple, oak, aspen, cottonwood, gum, and nearly all other deciduous forest trees throughout the United States.

EXHIBIT: Adults, eggs, larvæ, pupa, cocoons.

**144. The Tufted Tent-Caterpillar.***Malacosoma (Clisiocampa) constricta* Stretch.

Larvæ on oak in California.

EXHIBIT: Adults, eggs, larvæ.

**145. The American Tent-Caterpillar.***Malacosoma (Clisiocampa) americana* Fab.

Larvæ principally destructive to fruit trees, but also to wild cherry and a few other forest trees in the Eastern States.

EXHIBIT: Adults, eggs.

**146. The Rocky Mountain Tent-Caterpillar.***Malacosoma (Clisiocampa) fragilis* Stretch.

Larvæ feed on deciduous forest trees generally, and are at times very destructive. Rocky Mountain States.

EXHIBIT: Adults, eggs, larvæ.

**147. The Northwestern Tent-Caterpillar.***Malacosoma (Clisiocampa) plurialis* Dyar.

Larvæ on most species of deciduous forest trees in the Northwestern States.

EXHIBIT: Adults, larva, cocoon.

**148. The Californian Tent-Caterpillar.***Malacosoma (Clisiocampa) californica* Pack.

Larvæ on oak in California.

EXHIBIT: Adults, larva.

**149. The Spring Canker-Worm.***Paleacrita vernata* Harr.

The larvæ feed upon the surface of the leaves of various forest and shade trees, especially upon elm in the Eastern States.

EXHIBIT: Adults, pupa.

## CASE 30.

**150. The Cherry-Leaf Webworm.***Calocalpe undulata* Linn.

The larvæ live in webs on the terminal shoots of black cherry.

EXHIBIT: Adults, work.

**151. The Western Oak Span-Worm.***Therina somnaria* Hulst.

The larvæ occur on oak in the Northwestern States, sometimes defoliating trees.

EXHIBIT: Adults, pupæ.

**152. The Large Forest Span-Worm.***Sabulodes transversata* Dru.

Larvæ occur on maple, poplar, oak, etc.

EXHIBIT: Adults, larva.

**153. The Crinkly Flannel Moth.***Lagoa crispata* Pack.

The larvæ, which somewhat resemble the slug caterpillars, feed upon oak, poplar, and a variety of other deciduous trees.

EXHIBIT: Adults.



**154. The Oak Webworm.***Archips (Cacacia) fervidana* Clem.

Larvæ live in colonies on oak, sheltered by a web inclosing leaves and a mass of excrement.

EXHIBIT: Adults.

**155. The Slug Caterpillars.***Family Cochliidiæ.*

These bright-colored slug-like larvæ feed very generally on foliage of most deciduous trees.

EXHIBIT: the following species: *Sibine stimulea* Clem., adults, larva, cocoon; *Euclea delphinii* Bd., adult; *Euclea indetermina* Bd., adult.

**THE FALSE CATERPILLARS OR SAWFLIES. FAMILY TENTHREDINIDÆ.****PART OF CASE 30.****156. Abbot's White-Pine Sawfly.***Lophyrus abbotii* Leach.

This species, together with several closely allied forms, is at times very destructive to pine.

EXHIBIT: Adults, larvæ, cocoons.

**157. The Larch Sawfly.***Nematus erichsonii* Hartig.

One of the most destructive forest insects; the larvæ at various times past entirely defoliated the larch throughout the Northeastern States and caused the death of a large proportion of the trees.

EXHIBIT: Adults.

**158. The Large American Sawfly.***Cimbex americana* Leach.

Larvæ destroy foliage of elm, willow, poplar, and linden.

EXHIBIT: Adult.

**MISCELLANEOUS FOLIAGE INSECTS.****PART OF CASE 30.****159. The Common Walking Stick.***Diapheromera femorata* Say.

Young and adults devour foliage of deciduous forest trees.

EXHIBIT: Adult.

**160. Katydid.***Microcentrum laurifolium* Linn.

Young and adults feed on foliage of trees.

EXHIBIT: Adult, eggs.

**LEAF-BEETLES. FAMILY SCARABÆIDÆ.****PART OF CASE 31.****161. The Rhinoceros Beetle.***Dynastes tityus* Linn.

Larvæ mine in decaying stumps; adults destroy foliage of ash.

EXHIBIT: Adults.

**162. The Goldsmith Beetle.***Cotalpa lanigera* Linn.

Adults on oak, poplar, and other deciduous trees, sometimes defoliating them.

EXHIBIT: Adults.

**THE LEAF-BEETLES. FAMILY CHRYSOMELIDÆ.****PART OF CASE 31.****163. The Imported Elm Leaf-Beetle.***Galerucella luteola* Müll.

A very serious enemy to the elm in the Eastern States.

EXHIBIT: Adults, work.

**164. The Larger Elm Leaf-Beetle.***Monocesta coryli* Say.

Adults and larvæ destroy foliage of elm in sections of the Middle West.

EXHIBIT: Adults, work.

**165. The Striped Willow Leaf-Beetle.***Melasoma scripta* Fab.

Both larvæ and adults feed on foliage of poplar and willow, and are at times very destructive to these trees. An especial enemy of the osier willow industry.

EXHIBIT: Adults, pupæ.

**166. The Spotted Willow Leaf-Beetle.***Melasoma lapponica* Linn.

Habits similar to the above, but less abundant and injurious.

EXHIBIT: Adults.

**INJURING THE FRUIT.****THE WEEVILS. FAMILY CURCULIONIDÆ.****PART OF CASE 31.****167. The Nut Weevils.**Genus *Balaninus*.

There are numerous species, the larvæ of which live within acorns and nuts of various sorts.

EXHIBIT: Adults of the following species: *Balaninus nasicus* Say, *Balaninus caryæ* Horn, *Balaninus quercus* Horn.**168. The Walnut Fruit Weevil.***Conotrachelus juglandis* Lec.

The larvæ live in green fruit of walnut.

EXHIBITS: Adults.

**CONE AND NUT WORMS. ORDER LEPIDOPTERA.****PART OF CASE 31.****169. The Hickory Husk-Worm.***Grapholitha caryana* Fitch.

The larvæ live within the immature nuts and husks of the hickory and pecan.

EXHIBIT: Adults, work.

**170. The Spruce Cone-Worm.***Dioryctia reniculella* Grt.

Larvæ attack cones of spruce.

EXHIBIT: Adult, work.

**171. The Southern Pine Cone-Worm.**

An insect closely allied to the spruce cone-worm which attacks the cone of the Southern longleaf pine.

EXHIBIT: Work.

## INJURING THE TWIGS AND SMALLER BRANCHES.

### THE CICADAS. FAMILY CICADIDÆ.

#### PART OF CASE 31.

#### 172. The Seventeen-Year Cicada.

*Tibicen septendecim* Linn.

A most destructive species, but owing to the long period required by the young to reach maturity only injurious during certain years.

EXHIBIT: Adults, pupa, work.

### THE SCALE INSECTS. FAMILY COCCIDÆ.

#### PART OF CASE 31.

#### 173. The Cottony Maple Scale.

*Pulvinaria innumerabilis* Rathv.

Becomes at times very abundant on twigs of maple.

EXHIBIT: Adult scales on twigs.

#### 174. The Gloomy Maple Scale.

*Aspidiotus tenebricosus* Comst.

At times very abundant on maple. Principally injurious to shade trees in the neighborhood of towns.

EXHIBIT: Adult scales on bark.

#### 175. The Hickory Soft Scale.

*Lecanium* sp.

At times abundant on hickory and pecan in the Southern States.

EXHIBIT: Adult scales on twigs.

### THE TWIG WEEVILS. FAMILY CURCULIONIDÆ.

#### PART OF CASE 32.

#### 176. The Western Spruce Weevil.

*Pissodes* sp.

Attacks and kills the terminal shoots of Sitka spruce, causing deformed trees. Northwestern States.

EXHIBIT: Adults, larvæ, work.

#### 177. The White-Pine Weevil.

*Pissodes strobi* Peck.

Attacks and kills the terminal shoots of white pine, spruce, and deodar, causing serious deformity to the tree; also breeds in the bark of the lower portions of the trunk of pine and spruce, hastening the death of injured trees. Eastern States.

EXHIBIT: Adults, work. Sections of young white pine showing nature of injury to terminal shoots. (Large case.)

### ROUND-HEADED BORERS. FAMILY CERAMBYCIDÆ.

#### PART OF CASE 32.

#### 178. The Oak Pruner.

*Elaphidion villosus* Fab.

The larvæ bore in twigs of living oak, hickory, etc., causing them to break and fall.

EXHIBIT: Adults, work.

**179. The Hickory Twig Girdler.***Oncideres cingulata* Sáy.

The adult girdles the twigs of oak, hickory, persimmon, and other trees, sometimes so extensively as to cause serious injury.

EXHIBIT: Adults, work, figure.

**INJURING THE INNER BARK AND SAPWOOD.****THE BARK WEEVILS. FAMILY CURCULIONIDÆ.****CASE 33.****180. The Cypress Weevil.***Eudocimus mannerheimii* Boh.

The adults feed on the bark of bald cypress twigs, causing their death, and the larvæ mine the inner bark of injured and recently felled trees. Southern States.

EXHIBIT: Adult, larva, work.

**181. The Pales Weevil.***Hyllobius pales* Hbst.

The larvæ bore into the inner bark of stumps and roots of recently felled, dying, and injured pine. Eastern States.

EXHIBIT: Adults.

**182. The Pitch-Eating Weevil.***Pachylobius picivorus* Germ.

Has habits similar to the pales weevil. Eastern States.

EXHIBIT: Adults.

**183. The Walnut Weevil.***Cryptorhynchus parochus* Hbst.

The larvæ mine the inner bark and sapwood of weakened and recently dead walnut.

EXHIBIT: Adults, work.

**184. The Fir Weevil.***Pissodes dubius* Rand.

The larvæ mine the inner bark of balsam fir, hastening the death of injured trees. Northeastern States.

EXHIBIT: Adults, larvæ, work.

**THE ROUND-HEADED BORERS. FAMILY CERAMBYCIDÆ.****CASE 34.****185. The White-Pine Sawyer.***Monohammus scutellatus* Say.

Larvæ mine the inner bark and bore deep into the sapwood of white and silver pine, hastening the death of dying trees and injuring saw logs.

EXHIBIT: Adults, work.

**186. The Common Pine Sawyer.***Monohammus confusor* Kirby.

The larvæ mine the inner bark and bore large holes into the sapwood of dying trees and saw logs of pine and spruce.

EXHIBIT: Adults, larva.

**187. The Ponderous Pine-Borer.***Ergates spiculatus* Lec.

Larvæ bore in dead pine logs, injuring them for timber. Northwestern States.

EXHIBIT: Adults, larva, work.

**188. The Knob-Horned Pine-Borer.***Acanthocinus nodosus* Fab.

The larvæ mine the inner bark of pine stumps and large logs.

EXHIBIT: Adults.

**189. The Obsolete Pine-Borer.***Acanthocinus obsoletus* Ol.

The larvæ mine the inner bark of freshly killed pine.

EXHIBIT: Adults.

**190. The Small Pine Bark-Borer.***Ceratographis pusillus* Kirby.

Larvæ mine the inner bark of dead and dying pine.

EXHIBIT: Adults.

**191. The Lesser Pine-Borer.***Asemum mæstum* Hald.

Larvæ bore into sapwood of dead pine and spruce logs and stumps. Eastern States.

EXHIBIT: Adults.

**CASE 35.****192. The Poplar Borer.***Saperda calcarata* Say.

Larvæ bore in trunks of living aspen, cottonwood, and willow, causing great destruction to these trees.

EXHIBIT: Adults, work.

**193. The Common Elm-Tree Borer.***Saperda tridentata* Ol.

The larvæ mine the bark and sapwood of dead, dying, and healthy elm, often causing great destruction.

EXHIBIT: Adults, work.

**194. The Poplar Girdler.***Saperda concolor* Lec.

Larvæ mine in green bark of aspen and cottonwood saplings, girdling the trunks and causing large swellings; also attack willow.

EXHIBIT: Adults, work.

**195. The Sugar-Maple Borer.***Plagionotus speciosus* Say.

Larvæ mine the inner bark and sapwood of recently dead, dying, and living maple, often causing the death of weakened trees.

EXHIBIT: Adults.

**196. The Locust Borer.***Cyllene robiniae* Forst.

Larvæ mine the wood and bark of living locust, causing great damage and destruction.

EXHIBIT: Adults, work.

**197. The Linden Borer.***Saperda vestita* Say.

Larvæ mine the inner bark and bore into the trunk of linden, causing much injury.

EXHIBIT: Adults, work.

**198. The Chestnut Callidium.***Callidium areum* Newm.

Larvæ mine inner bark of chestnut, hastening, and perhaps causing, death of aged or injured trees.

EXHIBIT: Adults, larvæ, pupa.

**199. The Belted Chion.***Chion cinctus* Dru.

The larvæ mine the inner bark and bore into the wood of trunk and branches of dying and recently dead hickory, chestnut, oak, etc.

EXHIBIT: Adults, larva, work.

**200. The Dusty Oak Borer.***Romaleum atomarium* Dru.

Larvæ in stumps and logs of recently dead oak.

EXHIBIT: Adults.

**CASE 36.****201. The Beautiful Hickory Borer.***Goes pulchra* Hald.

Larvæ bore in hickory.

EXHIBIT: Adults.

**202. The Tiger Hickory Borer.***Goes tigrina* DeG.

Larvæ mine the inner bark and sapwood of living hickory and oak.

EXHIBIT: Adults.

**203. The White-Lined Cypress Borer.***Physocnemum andreae* Hald.

Larvæ mine the inner bark and outer sapwood of bald cypress logs. Southern States.

EXHIBIT: Adults, larva, work.

**204. The Common Hickory Borer.***Saperda discoidea* Fab.

Larvæ mine the inner bark of injured, dying, and recently dead hickory.

EXHIBIT: Adults.

**205. The Blue-Winged Walnut Borer.***Gaurotes cyanipennis* Say.

Larvæ infest walnut.

EXHIBIT: Adults.

**206. The Lichen-like Beetle.***Leptostylus aculiferus* Say.

Larvæ mine the inner bark of dying and dead tulip-tree (*Liriodendron*).

EXHIBIT: Adults.

**207. The Ash-Colored Mulberry Borer.***Heteremis cinerea* Ol.

Adults feed on the foliage and larvæ mine the green bark and sapwood of dying and injured mulberry.

EXHIBIT: Adults.

**208. The Painted Hickory Borer.***Cyllene picta* Dru.

Larvæ bore in the trunks of dead, dying, and sometimes healthy hickory trees.

EXHIBIT: Adults.

## CASE 37.

**209. The Curious Cypress Borer.***Curius dentatus* Newm.

Larvæ mine the smaller branches of young bald cypress.

EXHIBIT: Adults, work.

**210. The Banded Ash Borer.***Neoclytus caprea* Say.

Larvæ very injurious to dying trees and saw logs of black ash, boring numerous holes through the wood.

EXHIBIT: Adults, work.

**211. The Rigid Cypress Borer.***Eme rigida* Say.

Larvæ mine inner bark of girdled bald cypress and dying white cedar.

EXHIBIT: Adult, larva, work.

**212. The Southern Oak Borer.***Mallodon dasystomus* Say.

Larvæ bore in healthy live oak, hackberry, and hickory trees, greatly injuring them. Southern States.

EXHIBIT: Adults.

**213. The Live-Oak Root-Borer.***Mallodon melanopus* Linn.

Larvæ bore into the roots of young oaks, causing dwarfed and worthless trees. Southern States.

EXHIBIT: Adult.

**214. The Variable Oak Borer.***Phymatodes variabilis* Fab.

Larvæ mine inner bark of dying and recently dead oak; are also injurious to tan-bark.

EXHIBIT: Adult, work.

**215. The Thunderbolt Beetle.***Arhopalus fulminans* Fab.

Larvæ mine the inner bark and sapwood of chestnut and oak.

EXHIBIT: Adults.

**216. The Lesser Prionus.***Orthosoma brunneum* Forst.

Larva in decaying logs and stumps of nearly all forest trees.

EXHIBIT: Adults.

**217. The Cottonwood Root-Borer.***Plectrodera scalator* Fab.

Larvæ in roots of aspen and cottonwood.

EXHIBIT: Adults.

**218. The Broad-Necked Prionus.***Prionus laticollis* Dru.

Larvæ in roots of oak, aspen, and cottonwood. Sometimes destructive. Also in stumps of pine.

EXHIBIT: Adults.

## CASE 38.

**219. The Destructive Spruce Wood-Borer.***Tetropium cinnamopterum* Kirby.

Larvæ mine green bark and wood of injured and dying spruce, hastening death and promoting decay.

EXHIBIT: Adults, larvæ, work.

**220. The Wavy Spruce Borer.***Xylotrechus undulatus* Say.

Larvæ mine the inner bark and sapwood of Douglas spruce, fir, and hemlock.

EXHIBIT: Adults.

**221. The Canadian Leptura.***Leptura canadensis* Fab.

Larvæ mine sapwood of dead spruce and hemlock, inducing rapid decay.

EXHIBIT: Adults.

**222. The Red-Headed Clytus.***Neoclytus erythrocephalus* Fab.

Larvæ mine in dead and dying bark and sapwood of a great variety of forest trees, maple, ash, hickory, sweet gum, bald cypress, etc.

EXHIBIT: Adults.

**223. The Ribbed Pine Borer.***Rhagium lineatum* Ol.

Larvæ mine the inner bark of dying and dead pine, spruce, and some other conifers.

EXHIBIT: Adults, larvæ, pupa, work.

**224. The Black-Horned Pine Borer.***Callidium antennatum* Newm.

Larvæ mine inner bark and wood of dying and dead pine, cedar, etc.

EXHIBIT: Adults, work.

**225. The Four-Marked Ash Borer.***Eburia quadrigeminata* Say.

Larvæ infest ash and hickory.

EXHIBIT: Adults.

**226. The Cedar Borer.***Hylotrupes ligneus* Fab.

Larvæ mine inner bark and sapwood of white cedar, causing the death of the trees.

EXHIBIT: Adults, larvæ, pupa, work.

**227. The Banded Urographis.***Urographis fasciatus* Horn.

The larvæ mine the inner bark of dead oak, maple, chestnut, sweet gum, hickory, walnut, sourwood, dogwood, and probably nearly all deciduous trees. Eastern States.

EXHIBIT: Adults.

**228. The Rustic Borer.***Xylotrechus colonus* Fab.

Larvæ mine the inner bark and sapwood of recently cut or dying oak, chestnut, hickory, maple, and other hard woods.

EXHIBIT: Adults.



**THE FLAT-HEADED BORERS. FAMILY BUPRESTIDÆ.****CASE 39.****229. The Bronze Birch Borer.***Agrilus anxius* Gory.

The larvæ mine the inner bark of living and injured birch, aspen, and cottonwood. Very destructive in the Northern States.

EXHIBIT: Adults, work.

**230. The Two-Lined Chestnut Borer.***Agrilus bilineatus* Web.

The slender larvæ mine the inner bark of recently dead, injured, and healthy chestnut and oak. One of the principal causes for the wholesale destruction of chestnut in the Southern States.

EXHIBIT: Adults, work.

**231. The Eastern Hemlock Bark-Borer.***Melanophila fulvoguttata* Harr.

Larvæ mine the inner bark of recently dead and injured hemlock in the Eastern States.

EXHIBIT: Adults, work.

**232. The Flat-Headed Apple-Tree Borer.***Chrysobothris femorata* Fab.

The larvæ mine the inner bark of recently dead and injured oak, chestnut, hickory, maple, and some other deciduous forest trees. Eastern States.

EXHIBIT: Adults, larvæ, pupæ, work.

**CASE 40.****233. The Flat-Headed Pine Bark-Borer.***Chrysobothris dentipes* Germ.

Larvæ mine the inner bark of recently dead and dying pine.

EXHIBIT: Adults.

**234. The Flat-Headed Hickory Borer.***Dicercia obscura* Fab.

Larvæ bore into the trunk and limbs of hickory, maple, and some other deciduous trees.

EXHIBIT: Adults.

**235. The Western Hemlock Bark-Borer.***Melanophila drummondi* Kirby.

The larvæ mine the inner bark of dead and healthy western hemlock and Douglas spruce, causing defects in the lumber and killing trees. Northwestern States.

EXHIBIT: Adults, larva, pupa, work.

**INJURING THE WOOD.****THE FLAT-HEADED BORERS. FAMILY BUPRESTIDÆ.****PART OF CASE 40.****236. The Turpentine Borer.***Buprestis apicans* Hbst.

The larvæ bore into the solid resinous heartwood of longleaf pine after "boxing" by turpentine workers, so weakening the trunk as to cause it to break and spoiling portions of it for lumber.

EXHIBIT: Adult, work.

**237. The Golden Buprestis.***Buprestis aurulenta* Linn.

Larvæ bore into trunks of dead pines, spruce, fir, and other conifers.

EXHIBIT: Adults.

**238. The Heart-wood Pine Borer.***Chalcophora virginienensis* Dru.

Larvæ bore into trunks of dead pine and spruce and into heartwood of living trees.

EXHIBIT: Adults, work.

**THE TIMBER BEETLES. FAMILY SCOLYTIDÆ.****PART OF CASE 41.****240. The Hickory Timber-Beetle.***Xyleborus celsus* Eich.

The adults excavate long branching galleries in dying trees and logs of hickory.

EXHIBIT: Adults, work.

**THE POWDER-POST BEETLES. FAMILY PTINIDÆ.****PART OF CASE 41.****242. The Red-Shouldered Ptinid Borer.***Sinoxylon basillare* Say.

Adult bores short curved galleries in branches of dead hickory, persimmon, and most other deciduous trees; the larvæ bore the solid wood.

EXHIBIT: Adults, work.

**243. Powder-Post Beetles.**Genus *Lyctus*.

EXHIBIT: Work, sections of seasoned ash and hickory showing characteristic injury by the beetles and larvæ.

**THE TIMBER WORMS. FAMILIES BRENTHIDÆ AND LYMEXYLIDÆ.****PART OF CASE 41.****244. The Northern Brenthis.***Eupsalis minuta* Dru.

The larvæ excavate extensive galleries in solid wood of recently dead and dying oak, chestnut, beech, elm, bald cypress, and most other species of deciduous forest trees.

EXHIBIT: Adults, work.

**245. The Chestnut Timber Worm.***Lympexylon sericeum* Harr.

The larvæ excavate extensive galleries in the heartwood and sapwood of living and dead chestnut and oak.

EXHIBIT: Adult, work.

**THE CARPENTER WORMS. ORDER LEPIDOPTERA, FAMILY COSSIDÆ.****CASE 42.****246. The Leopard Moth.***Zeuzera pyrina* Fab.

An introduced species very injurious to forest, shade, and orchard trees in the vicinity of New York City.

EXHIBIT: Adults, larvæ, pupa, work.

**247. The Oak Carpenter Worm.***Prionoxystus robiniae* Peck.

The larvæ mine in living oak and locust, and are sometimes very destructive, especially to aged trees.

EXHIBIT: Adults, work.

**248. The Poplar Carpenter Worm.***Cossus centerensis* Lint.

The larvæ mine in trunks of cottonwood.

EXHIBIT: Adults.

**THE HORNTAILS OR WOOD WASPS. FAMILY UROCERIDÆ.****CASE 43.****249. The Pigeon Tremex.***Tremex columba* Linn.

Larvæ mine the sapwood of hickory, oak, poplar, maple, and other deciduous forest trees, hastening the death of those weakened by other causes.

EXHIBIT: Adults, work.

**250. The Pale Tremex.***Tremex sericeus* Say.

Habits like the pigeon tremex.

EXHIBIT: Adults.

**251. The White-Horned Horntail.***Urocerus albicornis* Fab.

Attacks spruce, hemlock, and fir.

EXHIBIT: Adults, larva, pupa, work.

**252. The Blue Horntail.***Paururus cyaneus* Fab.

Attacks spruce and fir.

EXHIBIT: Adult.

**253. The Banded Horntail.***Urocerus abdominalis* Harr.

Attacks spruce.

EXHIBIT: Adults.

**254. The Yellow-Winged Horntail.***Urocerus flavipennis* Kirby.

Attacks spruce.

EXHIBIT: Adults.

**255. The Small-Pine Horntail.***Paururus pinicola* Ashm.

Larvæ in pine.

EXHIBIT: Adults.

**256. The Black-Pine Horntail.***Paururus hopkinsi* Ashm.

Larvæ in pine.

EXHIBIT: Adults.

**PARASITIC ENEMIES. FAMILY ICHNEUMONIDÆ.****PART OF CASE 43.****257. The Lunated Long-Sting.***Thalessa lunator* Fab.

There are several quite similar species of these insects, which, by means of the long, thread-like appendage to the body, deposit their eggs within the galleries of the horntail larvæ, upon which their own larvæ are parasitic.

EXHIBITS: Adults.

**INJURING INNER BARK.****THE BARK-BEETLES. FAMILY SCOLYTIDÆ.****CASE 44.****258. The Pine-Destroying Beetle of the Black Hills.***Dendroctonus ponderosæ* Hopk.

Attacks healthy pine and spruce in the Black Hills of South Dakota and Rocky Mountain region. The adult beetles excavate characteristic galleries in the inner bark of dead, dying, and healthy trees. Their eggs are deposited along the sides of these galleries, and the larvæ developing from them mine the inner bark. It is estimated that it has been the primary cause of the destruction of 1,000,000,000 feet of western yellow pine (*Pinus ponderosa*) in the Black Hills.

EXHIBIT: Adults, work. Sections of trunks of western yellow pine attacked by beetles showing pitch tubes on surface and marks of galleries in inner bark.

**CASE 45.****259. The Destructive Pine Bark-Beetle.***Dendroctonus frontalis* Zimm.

Attacks healthy pine and spruce in the Southern States. It is capable of enormous destruction and, though usually held in check by natural causes, has at various times past so increased as to seriously menace the entire stand of pine and spruce in portions of the Southeastern States, notably in West Virginia in 1891-92.

EXHIBIT: Adults, work. Markings on surface of wood of beetle-killed tree; appearance of outer bark of beetle-killed trees; outer bark of tree scaled off by woodpeckers in search of beetles and their larvæ.

**260. The Oregon Tomicus.***Tomicus oregoni* Eich.

A secondary enemy of pine, attacking and hastening the death of trees primarily attacked by the pine-destroying beetle.

EXHIBIT: Work. Section of top of western yellow pine, showing galleries of adult beetles in inner bark.

**261. The Companion Bark-Beetle.***Tomicus avulsus* Eich.

A common species infesting pine in the Southern States. When abundant it attacks and kills healthy trees, but it is especially common as a secondary enemy in company with the destructive bark-beetle *Dendroctonus frontalis* Zimm.

EXHIBIT: Adults, work.

**CASE 46.****262. The Lawson Cypress Bark-Beetle.***Phloeosinus cupressæ* Hopk.

Attacks transplanted Lawson and Monterey cypress in California. It also attacks redwood.

EXHIBIT: Adults, work.

**263. The Hickory Bark-Beetle.***Scolytus quadrispinosus* Say.

A common bark-beetle in hickory, frequently causing the death of trees. The adults also do some damage by gnawing the base of small twigs, causing their death.

EXHIBIT: Adults, work.

**CASE 47.****264. The Mountain Pine Dendroctonus.***Dendroctonus* n. sp.

Attacks living, injured, and recently felled mountain or silver pine, sugar pine, and lodgepole pine in the Northwestern States. Very common and capable of great destruction to the best timber.

EXHIBIT: Adults, work.

**265. The Arizona Dendroctonus.***Dendroctonus* n. sp.

A common bark-beetle in the southern Rocky Mountain region, attacking healthy western yellow pine, and, in company with several closely allied species, causing great destruction of large quantities of the best timber.

EXHIBIT: Adults, work.

**266. The Bald Cypress Bark-Beetle.***Phloeosinus* n. sp.

Attacks recently felled and girdled bald cypress in the Southern States.

EXHIBIT: Adults, work.

**PREDACEOUS AND PARASITIC ENEMIES OF DESTRUCTIVE  
FOREST INSECTS. THE CLERIDS. FAMILY CLERIDÆ.**

**CASE 48.****267. The Dubius Clerid.***Thanasimus dubius* Fab.

The beetles destroy the adults, and the larvæ prey upon the developing broods of many species of bark-beetles in pine and spruce, and are frequently of the greatest benefit in holding in check the more destructive of these.

EXHIBIT: Adults.

**268. The Spider-like Clerid.***Clerus sphegeus* Fab.

The adults feed upon the adults and the larvæ upon the developing broods of numerous destructive bark-beetles in pine, spruce, and fir. Western States.

EXHIBIT: Adults.

**269. The European Bark-Beetle Destroyer.***Thanasimus formicarius* Linn.

Is very destructive to bark-beetles infesting pine and spruce in Europe, and was introduced into America in 1892 to act as a check to the alarming increase of the destructive bark-beetle (*Dendroctonus frontalis*) in West Virginia.

EXHIBIT: Adults.

**270. The Orange-Banded Clerid.***Clerus ichneumoneus* Fab.

The larvæ prey upon the developing broods of the hickory bark-beetle (*Scolytus quadrispinosus*).

EXHIBIT: Adults.

**271. The Hairy Clerid.***Chariessa pilosa* Forst.

The larvæ prey upon and do much toward preventing the increase of several of the destructive flat-headed borers (*Buprestidæ*) in deciduous trees.

EXHIBIT: Adults.

**THE CLICK BEETLES. FAMILY ELATERIDÆ.****272. The Eyed Elater.***Alaus oculatus* Linn.

As a larva preys upon numerous species of bark and wood boring insects in deciduous trees.

EXHIBIT: Adults.

**273. The Small-Eyed Elater.***Alaus myops* Fab.

As a larva preys upon the larger species of borers in coniferous trees.

EXHIBIT: Adults, larva.

**274. The Four-Winged Parasites.**

Order *Hymenoptera*. Families *Ichneumonidæ*, *Braconidæ*, *Chalcididæ*, etc.

EXHIBIT: Two larval galleries of the rigid cypress borer (*Eme rigida*), in one of which the insect attained full development, while in the other it was attacked and killed by a parasite, *Bracon* sp.

Adults and cocoons of several species which attack larvæ of butterflies and moths.

Adults and cocoons of several species which attack larvæ of wood-boring insects.

**THE TROGOSITIDS. FAMILY TROGOSITIDÆ.****275. The Green Trogositid.***Trogosita virescens* Fab.

A very important enemy of nearly all the larger and more destructive bark-beetles. The adults conceal themselves in the outer bark, and the larvæ enter the galleries and prey upon the insects therein.

EXHIBIT: Adults.

**THE COLYDIIDS. FAMILY COLYDIIDÆ.****276. The Tuberculate Colydiid.***Aulonium tuberculatum* Lec.

The adults enter the galleries and with the larvæ feed upon various species of bark-beetles in all their stages.

EXHIBIT: Adults.

**277. The Line-Marked Colydiid.***Colydium lineola* Say.

The adults enter the galleries and their larvæ feed upon the developing brood of various species of Ambrosia beetles.

EXHIBIT: Adults.

## **SPECIAL EXHIBITS.**

### **ENLARGED MODELS OF INSECTS, AND OF INSECTS AND INJURED PLANTS.**

#### **MALARIA MOSQUITO.**

*Anopheles maculipennis* Meig.

Enlarged model. This and other species of *Anopheles* are the only known transmitters of human malaria. The parasitic organism causing malaria inhabits the red-blood cells of human beings. It is taken with the blood into the stomach of the mosquito. There it undergoes a sexual development, reproduces, and the offspring are carried with the mosquito poison into the circulation of healthy human beings.

#### **YELLOW FEVER MOSQUITO.**

*Stegomyia fasciata* Fab.

Enlarged model. This mosquito transmits yellow fever, and it is now the opinion of the best-posted experts that only through its bite can one contract this disease.

#### **SALT MARSH MOSQUITO.**

*Culex sollicitans* Walk.

Enlarged model. This mosquito is not known to carry any disease, but is very annoying at many seaside resorts.

#### **THE HOUSE FLY.**

*Musca domestica* Linn.

Enlarged model. The house fly is not merely a nuisance, but also acts as a carrier of many diseases, especially of typhoid fever in the United States.

#### **HESSIAN FLY.**

*Mayetiola destructor* Say.

One of the most injurious enemies of wheat in the northern and central States. The larva attacks the stem. The average yearly damage to the wheat industry in this country from this insect is \$60,000,000.

Enlarged models of the adult fly, and of an infested stalk of wheat showing the puparium or so-called "flaxseed," which encloses the pupa stage of the insect.

Two natural-size models, one representing a healthy, unaffected young wheat plant to contrast with the same attacked by the Hessian fly; the other illustrating the effects of the attacks of the Hessian fly.

#### **THE SILKWORM.**

*Bombyx (Sericaria) mori* Linn.

Enlarged model of the larva, showing its complete anatomy; the muscles, nerves, tracheæ, viscera, the silk apparatus in its whole extent, the silk-secreting gland, and the gland discovered by Auzoux, which secretes a liquid the use of which is most probably to convert the silky matter into insoluble threads. In one of the prolegs may be seen the muscles which move the claws and sucking disks which enable the animal to walk with its true feet in the air.

Enlarged models of the moths, male and female. In each model is shown the atrophy of the digestive tube and the development of the marvelous organs by which the species is perpetuated. (After Auzoux.)

**HOP APHIS.***Phorodon humuli* Schr.

**UNAFFECTED HOP PLANT.**—A spray of hops, modeled in wax, representing the plant as it appears in vigorous growing condition and free from the attacks of its principal enemy, the hop aphid. This is to call attention to the stronger foliage and the more abundant and larger hops produced by plants from which the hop aphid has been eradicated by the use of proper remedies.

**AFFECTED HOP PLANT.**—A spray of hops, modeled in wax, representing the vine as it appears when attacked by the hop aphid, showing the blackening and discoloration of the leaves and the small and inferior hops, which are also discolored and otherwise unsuitable for market.

**WINTER EGGS.**—Enlarged model of the winter eggs, which are attached by the sexual female to the terminal twigs of the plum, in crevices around the buds.

**STEM-MOTHER.**—The stout female aphid shown in this enlarged model hatches from the winter egg and is characterized by shorter legs and honey-tubes. It gives birth, without the intervention of the male, to living young, of which three generations are produced on the plum trees, the last being winged and migrating to the hop.

**WINGED MIGRANT.**—This enlarged model represents the first winged generation, the third produced on the plum. It instinctively flies to the hop plant and is the progenitor of from five to twelve wingless generations of virgin females, which infest the hop plants until autumn and are the sole forms which depredate on the hop. In autumn the last generation again produces winged females which fly to the plum trees.

**HOP-AFFECTING STAGE.**—This enlarged model represents the structure and appearance of the five to twelve wingless generations of virgin females which people the hop plant until autumn. These are the progeny of the *winged migrants* and are the sole forms which injure the hop.

**RETURN MIGRANT.**—This enlarged model represents the last generation produced on the hop, the winged migrant form which in September returns again to the plum and gives birth to three or more young, which are the true sexual females, the first perfect sexual females produced in the cycle up to this point.

**PUCHA OF RETURN MIGRANT.**—This model represents the pupal stage of the *return migrant*. The striking features are the wing pads, which with another molt become the ample flight organs seen in the model of the adult.

**TRUE SEXUAL FEMALE.**—This enlarged model represents the generation born of the return migrant, which never acquire wings and never leave the plum tree. Maturing in a few days, according to the temperature, they are fertilized by the true winged males which have been subsequently developed on the hops and have come from the hop fields to the plum. Shortly after fertilization the winter eggs, like those with which the cycle started, are deposited.

**YOUNG SEXUAL FEMALE.**—This enlarged model represents the newly hatched stage of the only perfectly developed sexual female produced in the life cycle of this insect.

**WINGED MALE.**—This enlarged model represents the first and only male generation produced in the life cycle of the hop aphid. This is developed in the autumn and flies from the hop to the plum and fertilizes the true sexual females.

**CHINCH BUG.***Blissus leucopterus* Say.

**THE EGGS.**—This enlarged model represents the form of the egg and the terminal cap. The eggs are three-hundredths of an inch long, the top being squarely docked and surrounded by four round tubercles near the center. Color from pale whitish to amber.

**FIRST LARVAL STAGE.**—This stage, represented enlarged in this model, differs from the adult in being more elongate and in having two-jointed tarsi, the head broader and more rounded and the joints of the body subequal. The prevailing color of the whole body is red.

**SECOND LARVAL STAGE.**—After the first molt the form represented in this enlarged model is assumed. The red becomes a brilliant vermilion and contrasts with the pale band across the middle of the body, while the head and prothorax are dusky and coriaceous. Two broad marks appear on the mesothorax and the second, fourth, and fifth abdominal sutures, and one at the tip of the abdomen.

**PUCHA.**—The pupa shown in this enlarged model approaches still more nearly the form of the adult, and is not unlike the last larval stage except in being darker and in the appearance of wing pads, which extend almost across the pale basal abdominal joints.



**THE IMAGO.**—The mature insect which is represented enlarged in this model is elongate, blackish, and with numerous hairs, or pubescence. Its length is about three-twentieths of an inch. The outer wings are whitish, with a strong distinctive black spot.

### THE SAN JOSE SCALE.

*Aspidiotus perniciosus* Comst.

Ten enlarged models are exhibited illustrating the life cycle of this pest, which has caused more damage to the fruit industry and been the object of more legislation than any other insect. Its small size and inconspicuous appearance often leave it undetected until the infested trees are beyond recovery. The scale may be killed by fumigation or spraying.

Enlarged models are exhibited of the *first* and *second* larval stages, of the *young crawling larva*, *nearly full-grown larva*, *male pro-pupa*, *male pupa*, *adult male*, *adult female*, and of the *half-grown scale*, *full-grown male scale*, and *full-grown female scale*.

### THE ASIATIC LADYBIRD.

*Chilocorus similis* Rossi.

Two enlarged models are exhibited illustrating the adult and the larva of this insect, which was introduced by the U. S. Department of Agriculture from China, where it is the important agent in keeping the San José scale in check.

### THE CODLING MOTH.

*Carpocapsa pomonella* Linn.

Four enlarged models illustrating the life history of this insect, which is the cause of the "wormy apples." The damage from it in this country is estimated at \$11,000,000 annually.

Models are exhibited of the *larva* and of the *adult moth*; and also an enlarged section of a *piece of bark*, cut so as to show a cocoon and pupa of the codling moth beneath it, and an enlarged section of "wormy" apple showing egg, young and mature larva and their work.

### THE MEXICAN COTTON BOLL WEEVIL.

*Anthonomus grandis* Boh.

Enlarged model. This insect is a native of Cuba and Mexico; upwards of ten years ago the weevils crossed the Rio Grande near Brownsville and have now spread over nearly the entire cotton belt of Texas and into the western parishes of Louisiana. Its rapid extension, great destructiveness, and the unusual difficulties in the way of its control have caused grave fears for the future of the cotton industry in the United States. The Federal Government last year appropriated \$250 000 for combating this insect.

### THE HONEY BEE.

*Apis mellifera* Linn.

Enlarged models, showing the insect in six different forms—queen, male, wax-worker, worker, bee with propolis, and the bee with pollen. In these are shown the external and internal characters which distinguish each type. Also a model of a comb in the same proportion, in which are seen the cells for honey, for pollen, and for the eggs to produce queens, drones, and workers, with eggs, larvæ, and pupæ in different stages of development. (After Auzoux.)

### FLUTED SCALE.

*Icerya purchasi* Mask.

Model in wax of a twig of orange infested with the fluted scale (*Icerya purchasi*) copied directly from nature, the actual scales being transferred to the model plant. Illustrates the characteristic appearance of the infested plant.

**MODEL OF NONINFESTED ORANGE.**—The model in wax contrasts with the one representing the characteristic appearance of infested plant.

Illustrations from the publications of the Division of Entomology, representing the different stages of the fluted scale and its principal enemies.

**AUSTRALIAN LADYBIRD.***Novius (Vedalia) cardinalis* Muls.(Principal enemy of the fluted scale [*Icerya purchasi*].)

Enlarged model of the adult of this insect, the introduction of which from Australia has effected what was impossible by any other means—the practical annihilation of the fluted scale in California.

Enlarged models showing structure and characteristic appearance of the larva and pupa.

**THE "KISSING BUG."***Reduvius personatus* Linn.

Enlarged model of one of the group of true bugs, generally known as "assassin bugs," which of late years have acquired a certain newspaper notoriety through their supposed preference for the human lips.

They feed on other insects, which they pierce with their strong beaks; some species are frequently found in houses, attracted by light, and they may, if they believe themselves in danger, accidentally or in defense, pierce the human skin with their beaks, causing a painful wound, and often blood poisoning through the introduction of the germs of putrefaction.

**ORANGE RUST-MITE.***Eriophyes (Phytoptus) oleivorus* Ashm.

Wax models of oranges showing work of the orange rust-mite.

**ENLARGED MODELS OF THE PARASITE CAUSING MALARIA  
(ÆSTIVO-AUTUMNAL FEVER).***Plasmodium malariae*.

Twenty-nine enlarged models, illustrating the life history of this parasite in the blood of man and in the mosquito (*Anopheles*).

The models exhibited show: Development of spores in the blood of man; development of "crescent" in the blood of man; development of "gamete" in stomach of mosquito; development and fertilization of "zygote" in stomach of mosquito; development of "zygote" in stomach wall of mosquito; "zygote" filled with "blasts" and ready to burst; free endospores, free blasts, and spermatozoa.

**PHOTOGRAPHS OF INSECT DAMAGE TO FORESTS.**

Western yellow pine trees killed by the pine-destroying beetle. Black Hills, South Dakota.

Section of shortleaf pine tree killed by the destructive pine bark-beetle. North Carolina.

Trunk of western yellow pine killed by the Arizona Dendroctonus, showing work of beetles. New Mexico.

Western yellow pine tree, showing injury caused by the dark-red turpentine beetle at base. New Mexico.

Monterey pine tree, showing injury of the dark-red turpentine beetle at base. California.

Western hemlock trees killed in 1892 by the hemlock span-worm. State of Washington.

Trunk of hickory tree killed by the hickory bark-beetle, showing growth of white fungus following attack. Detroit, Mich.

Silver pine trees killed by the mountain-pine Dendroctonus. Priest River Forest Reserve, Idaho. (2.)

Bark from trunk of giant arborvitæ, showing mines of the cedar bark-beetle. State of Washington.

Log of Douglas spruce, showing galleries of the Douglas spruce Dendroctonus. State of Washington.

Storm-felled Douglas spruce offering favorable conditions for the propagation of the Douglas spruce Dendroctonus and other bark-bettles. State of Washington.

Bark from storm-felled log of Douglas spruce, showing galleries of the Douglas spruce Dendroctonus. State of Washington.

Group of longleaf pine killed by so-called "worm deadening." Eastern Texas.

Young Sitka spruce, showing top killed by western spruce-weevil. State of Washington.

Cottonwood tree killed by the bronzed Agrilus, showing the galleries of larvæ in trunk. Priest River Forest Reserve, Idaho.

Young chestnut killed by the two-lined chesnut borer. Western North Carolina.

Large chestnut, the death of which was hastened by insect injury. Western North Carolina.

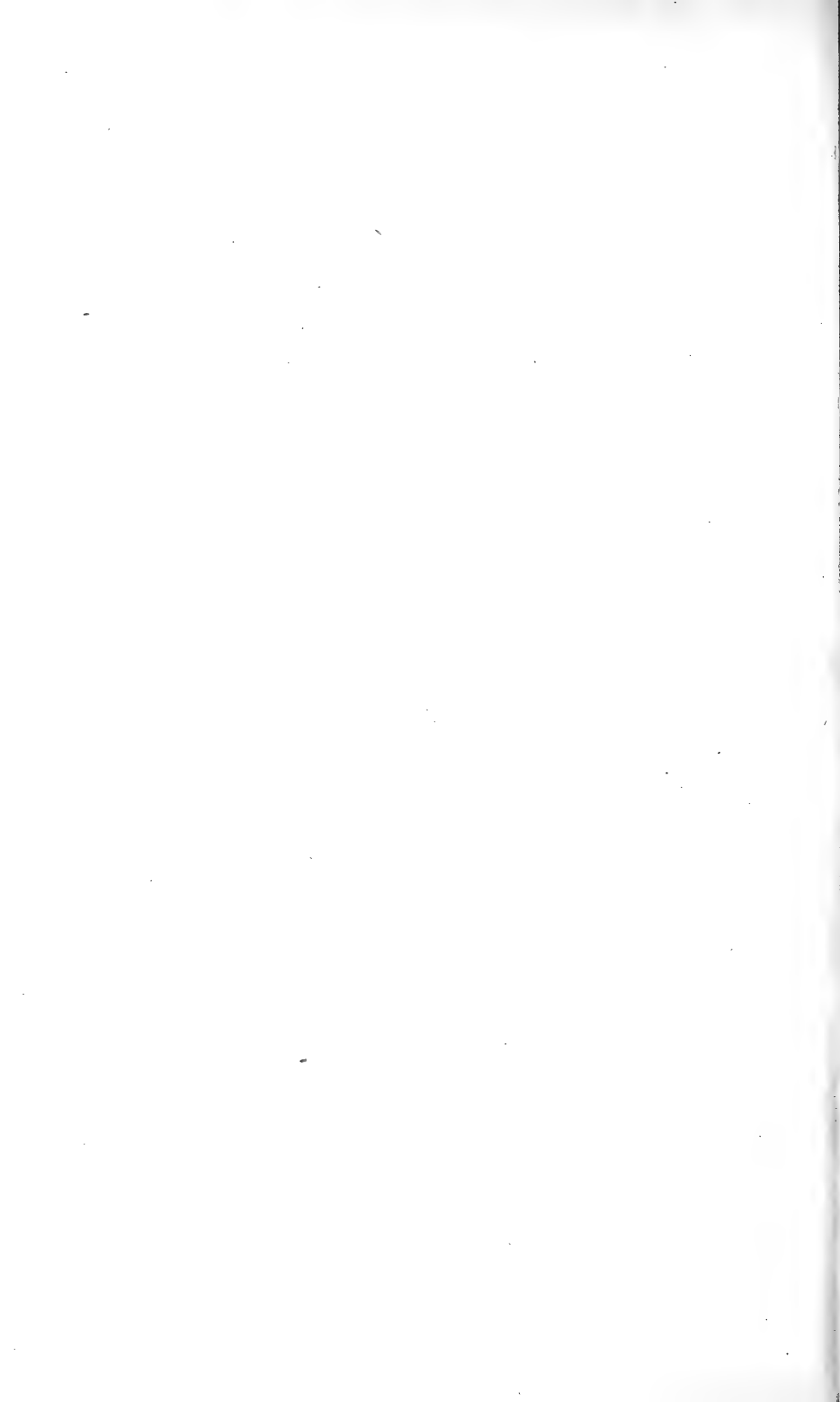
Girdled bald cypress tree injured by timber beetles. South Carolina.

Trunk of hickory killed by hickory bark-beetle, showing galleries on surface of wood. Western North Carolina.

### LIVING INSECTS.

By means of aquaria, vivaria, and other forms of insect cages, living insects will be on exhibit, subsisting on their natural food and undergoing their usual transformations.

In the aquaria, stages of some of the species of mosquitoes occurring on the Pacific coast will be shown, as also aquatic beetles and bugs and the aquatic larvæ of various insects which are terrestrial in the adult state.



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<sup>a</sup> Many of the forest insects are species which have not yet been described. The reader will, therefore, find these under the generic name, or in the Index of Common Names.

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